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PTO/SB/05 (2/98)

**UTILITY
PATENT APPLICATION
TRANSMITTAL**

Attorney Docket No.

210121.462C4

First Inventor or Application Identifier

Jennifer L. Mitcham

Title

**COMPOSITIONS AND METHODS FOR THE THERAPY
AND DIAGNOSIS OF OVARIAN CANCER**

Express Mail Label No.

EL615231951US

Only for nonprovisional applications under 37 CFR § 1.53(b)

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 202311. ☐ General Authorization Form & Fee Transmittal
(Submit an original and a duplicate for fee processing)2. ☒ Specification [Total Pages] **80**
(preferred arrangement set forth below)

- Descriptive Title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention

- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. ☒ Drawing(s) (35 USC 113) [Total Sheets] **97**

4. Oath or Declaration [Total Pages]

- a. ☐ Newly executed (original or copy)
- b. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 CFR 1.63(d)(2) and 1.33(b)

5. ☐ Incorporation By Reference (useable if box 4b is
checked) The entire disclosure of the prior application,
from which a copy of the oath or declaration is supplied
under Box 4b, is considered to be part of the disclosure of
the accompanying application and is hereby incorporated
by reference therein.6. ☐ Microfiche Computer Program (Appendix)7. Nucleotide and Amino Acid Sequence Submission
(if applicable, all necessary)

- a. ☒ Computer-Readable Copy
- b. ☒ Paper Copy (identical to computer copy)
- c. ☒ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS8. ☐ Assignment Papers (cover sheet & document(s))9. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☐ Power of Attorney10. ☐ English Translation Document (if applicable)11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations12. ☐ Preliminary Amendment13. ☒ Return Receipt Postcard14. ☐ Small Entity Statement(s) ☐ Statement filed in prior application,
Status still proper and desired15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)16. ☒ Other: Certificate of Express Mail

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information below and in a preliminary amendment

☐ Continuation ☐ Divisional ☒ Continuation-In-Part (CIP) of prior Application No.: 09/617,747Prior application information: Examiner not assigned Group / Art Unit not assigned☐ Claims the benefit of Provisional Application No. _____**CORRESPONDENCE ADDRESS**Jane E. R. Potter
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REGISTRATION NO. 46,209Date August 9, 2000

PATENT

For : COMPOSITIONS AND METHODS FOR THE THERAPY AND
DIAGNOSIS OF OVARIAN CANCER

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COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF OVARIAN CANCER

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. Application No.
5 09/617,747, filed 7/17/2000, which is a continuation-in-part of U.S. Application No.
09/404,879, filed September 24, 1999, which is a continuation-in-part of U.S. Application
No. 09/338,933, filed June 23, 1999, which is a continuation-in-part of U.S. Application
Nos. 09/216,003, filed December 17, 1999, and 09/215,681, filed December 17, 1998.

TECHNICAL FIELD

10 The present invention relates generally to ovarian cancer therapy. The
invention is more specifically related to polypeptides comprising at least a portion of an
ovarian carcinoma protein, and to polynucleotides encoding such polypeptides, as well as
antibodies and immune system cells that specifically recognize such polypeptides. Such
polypeptides, polynucleotides, antibodies and cells may be used in vaccines and
15 pharmaceutical compositions for treatment of ovarian cancer.

BACKGROUND OF THE INVENTION

Ovarian cancer is a significant health problem for women in the United
States and throughout the world. Although advances have been made in detection and
therapy of this cancer, no vaccine or other universally successful method for prevention or
20 treatment is currently available. Management of the disease currently relies on a
combination of early diagnosis and aggressive treatment, which may include one or more
of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone
therapy. The course of treatment for a particular cancer is often selected based on a variety
of prognostic parameters, including an analysis of specific tumor markers. However, the
25 use of established markers often leads to a result that is difficult to interpret, and high
mortality continues to be observed in many cancer patients.

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Immunotherapies have the potential to substantially improve cancer treatment and survival. Such therapies may involve the generation or enhancement of an immune response to an ovarian carcinoma antigen. However, to date, relatively few ovarian carcinoma antigens are known and the generation of an immune response against such antigens has not been shown to be therapeutically beneficial.

Accordingly, there is a need in the art for improved methods for identifying ovarian tumor antigens and for using such antigens in the therapy of ovarian cancer. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, this invention provides compositions and methods for the therapy of cancer, such as ovarian cancer. In one aspect, the present invention provides polypeptides comprising an immunogenic portion of an ovarian carcinoma protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with ovarian carcinoma protein-specific antisera is not substantially diminished. Within certain embodiments, the ovarian carcinoma protein comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387, 391 and complements of such polynucleotides.

The present invention further provides polynucleotides that encode a polypeptide as described above or a portion thereof, expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions and vaccines. Pharmaceutical compositions may comprise a physiologically acceptable carrier or excipient in combination with one or more of: (i) a polypeptide comprising an immunogenic portion of an ovarian carcinoma protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with ovarian carcinoma protein-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid

sequence encoded by a polynucleotide that comprises a sequence recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391; (ii) a polynucleotide encoding such a polypeptide; (iii) an antibody that specifically binds to such a polypeptide; (iv) an antigen-presenting cell that expresses such a polypeptide and/or (v) a T cell that specifically reacts with such a polypeptide. Vaccines may comprise a non-specific immune response enhancer in combination with one or more of: (i) a polypeptide comprising an immunogenic portion of an ovarian carcinoma protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with ovarian carcinoma protein-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence encoded by a polynucleotide that comprises a sequence recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391; (ii) a polynucleotide encoding such a polypeptide; (iii) an anti-idiotypic antibody that is specifically bound by an antibody that specifically binds to such a polypeptide; (iv) an antigen-presenting cell that expresses such a polypeptide and/or (v) a T cell that specifically reacts with such a polypeptide.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion protein or polynucleotide encoding a fusion protein in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, comprising a fusion protein or polynucleotide encoding a fusion protein in combination with a non-specific immune response enhancer.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for stimulating and/or expanding T cells, comprising contacting T cells with (a) a polypeptide

Within other aspects, the present invention provides methods for inhibiting the development of ovarian cancer in a patient, comprising administering to a patient T cells prepared as described above.

The present invention also provides, within other aspects, methods for identifying secreted tumor antigens. Such methods comprise the steps of: (a) implanting tumor cells in an immunodeficient mammal; (b) obtaining serum from the immunodeficient

mammal after a time sufficient to permit secretion of tumor antigens into the serum; (c) immunizing an immunocompetent mammal with the serum; (d) obtaining antiserum from the immunocompetent mammal; and (e) screening a tumor expression library with the antiserum, and therefrom identifying a secreted tumor antigen. A preferred method for
 5 identifying a secreted ovarian carcinoma antigen comprises the steps of: (a) implanting ovarian carcinoma cells in a SCID mouse; (b) obtaining serum from the SCID mouse after a time sufficient to permit secretion of ovarian carcinoma antigens into the serum; (c) immunizing an immunocompetent mouse with the serum; (d) obtaining antiserum from the immunocompetent mouse; and (e) screening an ovarian carcinoma expression library with
 10 the antiserum, and therefrom identifying a secreted ovarian carcinoma antigen.

The present invention also discloses antibody epitopes recognized by the O8E polyclonal anti-sera which epitopes are presented herein as SEQ ID NOs: 394-415.

Further disclosed by the present invention are 10-mer and 9-mer peptides predicted to bind HLA-0201 which peptides are disclosed herein as SEQ ID NOs: 416-435
 15 and SEQ ID NOs: 436-455, respectively.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

20 BRIEF DESCRIPTION OF THE DRAWINGS

Figures 1A-1S (SEQ ID NOs:1-71) depict partial sequences of polynucleotides encoding representative secreted ovarian carcinoma antigens.

Figures 2A-2C depict full insert sequences for three of the clones of Figure 1. Figure 2A shows the sequence designated O7E (11731; SEQ ID NO:72), Figure 2B
 25 shows the sequence designated O9E (11785; SEQ ID NO:73) and Figure 2C shows the sequence designated O8E (13695; SEQ ID NO:74).

Figure 3 presents results of microarray expression analysis of the ovarian carcinoma sequence designated O8E.

Figure 4 presents a partial sequence of a polynucleotide (designated 3g; SEQ ID NO:75) encoding an ovarian carcinoma sequence that is a splice fusion between the human T-cell leukemia virus type I oncoprotein TAX and osteonectin.

Figure 5 presents the ovarian carcinoma polynucleotide designated 3f (SEQ ID NO:76).

Figure 6 presents the ovarian carcinoma polynucleotide designated 6b (SEQ ID NO:77).

Figures 7A and 7B present the ovarian carcinoma polynucleotides designated 8e (SEQ ID NO:78) and 8h (SEQ ID NO:79).

Figure 8 presents the ovarian carcinoma polynucleotide designated 12c (SEQ ID NO:80).

Figure 9 presents the ovarian carcinoma polynucleotide designated 12h (SEQ ID NO:81).

Figure 10 depicts results of microarray expression analysis of the ovarian carcinoma sequence designated 3f.

Figure 11 depicts results of microarray expression analysis of the ovarian carcinoma sequence designated 6b.

Figure 12 depicts results of microarray expression analysis of the ovarian carcinoma sequence designated 8e.

Figure 13 depicts results of microarray expression analysis of the ovarian carcinoma sequence designated 12c.

Figure 14 depicts results of microarray expression analysis of the ovarian carcinoma sequence designated 12h.

Figures 15A-15EEE depict partial sequences of additional polynucleotides encoding representative secreted ovarian carcinoma antigens (SEQ ID NOs:82-310).

Figure 16 is a diagram illustrating the location of various partial O8E sequences within the full length sequence.

Figure 17 is a graph illustrating the results of epitope mapping studies on O8E protein.

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DETAILED DESCRIPTION OF THE INVENTION

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The present invention further provides ovarian carcinoma sequences that are identified using techniques to evaluate altered expression within an ovarian tumor. Such sequences may be polynucleotide or protein sequences. Ovarian carcinoma sequences are generally expressed in an ovarian tumor at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in normal ovarian tissue, as determined using a representative assay provided herein. Certain partial ovarian carcinoma polynucleotide sequences are presented herein. Proteins encoded by genes comprising such polynucleotide sequences (or complements thereof) are also considered ovarian carcinoma proteins.

Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to at least a portion of an ovarian carcinoma polypeptide as described herein. T cells that may be employed within the compositions provided herein are generally T cells (*e.g.*, CD4⁺ and/or CD8⁺) that are specific for such a polypeptide. Certain methods described herein further employ antigen-presenting cells (such as dendritic cells or macrophages) that express an ovarian carcinoma polypeptide as provided herein.

OVARIAN CARCINOMA POLYNUCLEOTIDES

Any polynucleotide that encodes an ovarian carcinoma protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides, and more preferably at least 45 consecutive nucleotides, that encode a portion of an ovarian carcinoma protein. More preferably, a polynucleotide encodes an immunogenic portion of an ovarian carcinoma protein, such as an ovarian carcinoma antigen. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. Additional coding or non-coding sequences may, but need not, be present

within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes an ovarian carcinoma protein or a portion thereof) or may comprise
5 a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native ovarian carcinoma protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably
10 at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native ovarian carcinoma protein or a portion thereof.

The percent identity for two polynucleotide or polypeptide sequences may be readily determined by comparing sequences using computer algorithms well known to
15 those of ordinary skill in the art, such as Megalign, using default parameters. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, or 40 to about 50, in which a sequence may be compared
20 to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned. Optimal alignment of sequences for comparison may be conducted, for example, using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. Preferably, the percentage of sequence identity is determined by comparing two optimally aligned sequences over a
25 window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the window may comprise additions or deletions (*i.e.*, gaps) of 20 % or less, usually 5 to 15 %, or 10 to 12%, relative to the reference sequence (which does not contain additions or deletions). The percent identity may be calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue

occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (*i.e.*, the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

5 Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native ovarian carcinoma protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS,
10 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a
15 polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of
20 one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For
25 example, an ovarian carcinoma polynucleotide may be identified, as described in more detail below, by screening a late passage ovarian tumor expression library with antisera generated against sera of immunocompetent mice after injection of such mice with sera from SCID mice implanted with late passage ovarian tumors. Ovarian carcinoma polynucleotides may also be identified using any of a variety of techniques designed to

evaluate differential gene expression. Alternatively, polynucleotides may be amplified from cDNA prepared from ovarian tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

5 An amplified portion may be used to isolate a full length gene from a suitable library (*e.g.*, an ovarian carcinoma cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for
10 identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial
15 colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial
20 sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments,
25 using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for

example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

5 One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by
10 amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Additional techniques include capture
15 PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

 In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that
20 available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

 Certain nucleic acid sequences of cDNA molecules encoding portions of ovarian carcinoma antigens are provided in Figures 1A-1S (SEQ ID NOS:1 to 71) and
25 Figures 15A to 15EEE (SEQ ID NOs:82 to 310). The sequences provided in Figures 1A-1S appear to be novel. For sequences in Figures 15A-15EEE, database searches revealed matches having substantial identity. These polynucleotides were isolated by serological screening of an ovarian tumor cDNA expression library, using a technique designed to identify secreted tumor antigens. Briefly, a late passage ovarian tumor expression library

was prepared from a SCID-derived human ovarian tumor (OV9334) in the vector λ -screen (Novagen). The sera used for screening were obtained by injecting immunocompetent mice with sera from SCID mice implanted with one late passage ovarian tumors. This technique permits the identification of cDNA molecules that encode immunogenic portions
 5 of secreted tumor antigens.

The polynucleotides recited herein, as well as full length polynucleotides comprising such sequences, other portions of such full length polynucleotides, and sequences complementary to all or a portion of such full length molecules, are specifically encompassed by the present invention. It will be apparent to those of ordinary skill in the
 10 art that this technique can also be applied to the identification of antigens that are secreted from other types of tumors.

Other nucleic acid sequences of cDNA molecules encoding portions of ovarian carcinoma proteins are provided in Figures 4-9 (SEQ ID NOs:75-81), as well as SEQ ID NOs:313-384. These sequences were identified by screening a microarray of
 15 cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in an ovarian tumor than in normal ovarian tissue, as determined using a representative assay provided herein). Such screens were performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad.*
 20 *Sci. USA* 94:2150-2155, 1997). SEQ ID NOs:311 and 391 provide full length sequences incorporating certain of these nucleic acid sequences.

Any of a variety of well known techniques may be used to evaluate tumor-associated expression of a cDNA. For example, hybridization techniques using labeled polynucleotide probes may be employed. Alternatively, or in addition, amplification
 25 techniques such as real-time PCR may be used (*see* Gibson et al., *Genome Research* 6:995-1001, 1996; Heid et al., *Genome Research* 6:986-994, 1996). Real-time PCR is a technique that evaluates the level of PCR product accumulation during amplification. This technique permits quantitative evaluation of mRNA levels in multiple samples. Briefly, mRNA is extracted from tumor and normal tissue and cDNA is prepared using standard techniques.

Real-time PCR may be performed, for example, using a Perkin Elmer/Applied Biosystems (Foster City, CA) 7700 Prism instrument. Matching primers and fluorescent probes may be designed for genes of interest using, for example, the primer express program provided by Perkin Elmer/Applied Biosystems (Foster City, CA). Optimal concentrations of primers and probes may be initially determined by those of ordinary skill in the art, and control (e.g., β -actin) primers and probes may be obtained commercially from, for example, Perkin Elmer/Applied Biosystems (Foster City, CA). To quantitate the amount of specific RNA in a sample, a standard curve is generated alongside using a plasmid containing the gene of interest. Standard curves may be generated using the Ct values determined in the real-time PCR, which are related to the initial cDNA concentration used in the assay. Standard dilutions ranging from 10^{-10} to 10^{-6} copies of the gene of interest are generally sufficient. In addition, a standard curve is generated for the control sequence. This permits standardization of initial RNA content of a tissue sample to the amount of control for comparison purposes.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding an ovarian carcinoma antigen, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo*.

A portion of a sequence complementary to a coding sequence (i.e., an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells or tissues to facilitate the production of antisense RNA. An antisense polynucleotide

may be used, as described herein, to inhibit expression of an ovarian carcinoma protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In* 5 Huber and Carr, *Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

10 Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl- methyl-, thio- and other 15 modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include 20 expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

25 Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide

may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (e.g., avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (i.e., an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

15

OVARIAN CARCINOMA POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof, as described herein. As noted above, certain ovarian carcinoma proteins are ovarian carcinoma antigens that are expressed by ovarian tumor cells and react detectably within an immunoassay (such as an ELISA) with antisera generated against serum from an immunodeficient animal implanted with an ovarian tumor. Other ovarian carcinoma proteins are encoded by ovarian carcinoma polynucleotides recited herein. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

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An "immunogenic portion," as used herein is a portion of an antigen that is recognized (i.e., specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more

preferably at least 10, and still more preferably at least 20 amino acid residues of an ovarian carcinoma protein or a variant thereof. Preferred immunogenic portions are encoded by cDNA molecules isolated as described herein. Further immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul,
 5 *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with ovarian carcinoma protein-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "ovarian carcinoma protein-specific" if they specifically bind to an ovarian carcinoma protein (*i.e.*, they react with the ovarian
 10 carcinoma protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera, antibodies and T cells may be prepared as described herein, and using well known techniques. An immunogenic portion of a native ovarian carcinoma protein is a portion that reacts with such antisera, antibodies and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in
 15 an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length protein. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide
 20 may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ^{125}I -labeled Protein A.

As noted above, a composition may comprise a variant of a native ovarian carcinoma protein. A polypeptide "variant," as used herein, is a polypeptide that differs
 25 from a native ovarian carcinoma protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with ovarian carcinoma protein-specific antisera may be enhanced or unchanged, relative to the native ovarian carcinoma protein, or may be diminished by less than 50%, and preferably less than 20%, relative to

the native ovarian carcinoma protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with ovarian carcinoma protein-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as

5 an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably

10 at least about 90% and most preferably at least about 95% identity to the native polypeptide. Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydrophobic nature of the polypeptide to be substantially

15 unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine,

20 isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. Variants may also (or alternatively) be

25 modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydrophobic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs

transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

5 Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector
10 containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following
15 concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means,
20 using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially
25 available from suppliers such as Applied BioSystems, Inc. (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises one polypeptide as described herein and a known tumor antigen, such as an ovarian carcinoma protein or a

variant of such a protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both
 5 immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques,
 10 including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide
 15 linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide
 20 folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides;
 25 and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA*

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as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology* 10:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to an ovarian carcinoma protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to an ovarian carcinoma protein if it reacts at a detectable level (within, for example, an ELISA) with an ovarian carcinoma protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a "complex" is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the

complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be determined using methods well known in the art.

5 Binding agents may be further capable of differentiating between patients with and without a cancer, such as ovarian cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a ovarian carcinoma antigen will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the
10 disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, leukophoresis, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a
15 statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an
20 RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of
25 monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without

modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more
5 booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.*
10 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell
15 fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection.
20 After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the
25 yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and

extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also

facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also

bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (e.g., U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and
 5 their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and
 10 immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

Also provided herein are anti-idiotypic antibodies that mimic an
 15 immunogenic portion of an ovarian carcinoma protein. Such antibodies may be raised against an antibody, or antigen-binding fragment thereof, that specifically binds to an immunogenic portion of an ovarian carcinoma protein, using well known techniques. Anti-idiotypic antibodies that mimic an immunogenic portion of an ovarian carcinoma protein are those antibodies that bind to an antibody, or antigen-binding fragment thereof, that
 20 specifically binds to an immunogenic portion of an ovarian carcinoma protein, as described herein.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T
 25 cells specific for an ovarian carcinoma protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be present within (or isolated from) bone marrow, peripheral blood or a fraction of bone marrow or peripheral blood of a mammal, such as a patient, using a commercially available cell separation system, such as the CEPRATE™ system, available from CellPro Inc., Bothell WA (see also

U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human animals, cell lines or cultures.

5 T cells may be stimulated with an ovarian carcinoma polypeptide, polynucleotide encoding an ovarian carcinoma polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, an ovarian carcinoma polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T
10 cells.

T cells are considered to be specific for an ovarian carcinoma polypeptide if the T cells kill target cells coated with an ovarian carcinoma polypeptide or expressing a gene encoding such a polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or
15 proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an
20 increased rate of DNA synthesis (e.g., by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with an ovarian carcinoma polypeptide (200 ng/ml - 100 µg/ml, preferably 100 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells and/or contact as described above for 2-3 hours should result in activation of
25 the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (e.g., TNF or IFN-γ) is indicative of T cell activation (see Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience (Greene 1998). T cells that have been activated in response to an ovarian carcinoma polypeptide, polynucleotide or ovarian carcinoma polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Ovarian

carcinoma polypeptide-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from a patient or a related or unrelated donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to an ovarian carcinoma polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to an ovarian carcinoma polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize an ovarian carcinoma polypeptide. Alternatively, one or more T cells that proliferate in the presence of an ovarian carcinoma polypeptide can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution. Following expansion, the cells may be administered back to the patient as described, for example, by Chang et al., *Crit. Rev. Oncol. Hematol.* 22:213, 1996.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, binding agents and/or immune system cells as described herein may be incorporated into pharmaceutical compositions or vaccines. Pharmaceutical compositions comprise one or more such compounds or cells and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds or cells and a non-specific immune response enhancer. A non-specific immune response enhancer may be any substance that enhances an immune response to an exogenous antigen. Examples of non-specific immune response enhancers include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example,

one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one
 5 or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and
 10 terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface. In a preferred embodiment, the DNA may be introduced using a viral expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus.
 15 Suitable systems are disclosed, for example, in Fisher-Hoch et al., *PNAS* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *PNAS*
 20 91:215-219, 1994; Kass-Eisler et al., *PNAS* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-
 25 1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be

formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral
 5 administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (*e.g.*, polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S.
 10 Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide) and/or
 15 preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of non-specific immune response enhancers may be employed in the vaccines of this invention. For example, an adjuvant may be included.
 20 Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI), Merck Adjuvant 65 (Merck and
 25 Company, Inc., Rahway, NJ), alum, biodegradable microspheres, monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of

Th1-type cytokines (e.g., IFN- γ , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (e.g., IL-4, IL-5, IL-6, IL-10 and TNF- β) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT; see US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). Also preferred is AS-2 (SmithKline Beecham). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule or sponge that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*) and based on the lack of differentiation

markers of B cells (CD19 and CD20), T cells (CD3), monocytes (CD14) and natural killer cells (CD56), as determined using standard assays. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor, mannose receptor and DEC-205 marker. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80 and CD86).

APCs may generally be transfected with a polynucleotide encoding a ovarian carcinoma antigen (or portion or other variant thereof) such that the antigen, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take

place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic
5 cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant
10 bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

15

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as ovarian cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient.
20 As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. Within certain preferred embodiments, a patient is afflicted with ovarian cancer. Such cancer may be diagnosed using criteria generally accepted in the
25 art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immuno response-modifying agents (such as tumor vaccines, bacterial adjuvants and/or cytokines).

5 Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T lymphocytes (such as CD8⁺ cytotoxic T
10 lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive
15 immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding
20 single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a
25 sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression

system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al.,
 5 *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into stem cells taken from a patient and clonally propagated *in vitro* for autologous transplant back into the same patient.

Routes and frequency of administration, as well as dosage, will vary from
 10 individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration), orally or in the bed of a resected tumor. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at
 15 intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies
 20 in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and
 25 vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit.

Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to an ovarian carcinoma antigen generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

SCREENS FOR IDENTIFYING SECRETED OVARIAN CARCINOMA ANTIGENS

The present invention provides methods for identifying secreted tumor antigens. Within such methods, tumors are implanted into immunodeficient animals such as SCID mice and maintained for a time sufficient to permit secretion of tumor antigens into serum. In general, tumors may be implanted subcutaneously or within the gonadal fat pad of an immunodeficient animal and maintained for 1-9 months, preferably 1-4 months. Implantation may generally be performed as described in WO 97/18300. The serum containing secreted antigens is then used to prepare antisera in immunocompetent mice, using standard techniques and as described herein. Briefly, 50-100 μ L of sera (pooled from three sets of immunodeficient mice, each set bearing a different SCID-derived human ovarian tumor) may be mixed 1:1 (vol:vol) with an appropriate adjuvant, such as RIBI-MPL or MPL + TDM (Sigma Chemical Co., St. Louis, MO) and injected intraperitoneally into syngeneic immunocompetent animals at monthly intervals for a total of 5 months. Antisera from animals immunized in such a manner may be obtained by drawing blood after the third, fourth and fifth immunizations. The resulting antiserum is generally pre-cleared of *E. coli* and phage antigens and used (generally following dilution, such as 1:200) in a serological expression screen.

The library is typically an expression library containing cDNAs from one or more tumors of the type that was implanted into SCID mice. This expression library may be prepared in any suitable vector, such as λ -screen (Novagen). cDNAs that encode a polypeptide that reacts with the antiserum may be identified using standard techniques, and

sequenced. Such cDNA molecules may be further characterized to evaluate expression in tumor and normal tissue, and to evaluate antigen secretion in patients.

The methods provided herein have advantages over other methods for tumor antigen discovery. In particular, all antigens identified by such methods should be secreted or released through necrosis of the tumor cells. Such antigens may be present on the surface of tumor cells for an amount of time sufficient to permit targeting and killing by the immune system, following vaccination.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more ovarian carcinoma proteins and/or polynucleotides encoding such proteins in a biological sample (such as blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as ovarian cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of protein that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, an ovarian carcinoma-associated sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.,* Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder

of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, 5 such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with 10 the immobilized binding agent. Suitable polypeptides for use within such assays include full length ovarian carcinoma proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be 15 a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety 20 of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a 25 microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about

10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both
5 the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

10 In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a
15 detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as
20 described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20TM (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered
25 saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with ovarian cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art

will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an
 5 appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An
 10 appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate.
 15 Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

20 To determine the presence or absence of a cancer, such as ovarian cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients
 25 without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this

embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

10 In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing
15 the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second
20 binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of
25 polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use ovarian carcinoma polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such ovarian carcinoma protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with an ovarian carcinoma protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with an ovarian carcinoma protein, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with an ovarian carcinoma protein (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of ovarian carcinoma protein to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the ovarian carcinoma protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to
5 a polynucleotide encoding an ovarian carcinoma protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably
10 at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding an ovarian carcinoma protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes hybridize to a polynucleotide encoding a polypeptide described herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes
15 which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence provided herein. Techniques for both PCR based assays and hybridization assays are well known in the art (*see*, for example,
20 Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample such as a biopsy tissue and is reverse transcribed to produce cDNA molecules.
25 PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in

expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, ovarian carcinoma proteins and polynucleotides encoding such proteins may be used as markers for monitoring the progression of cancer.

- 5 In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide detected by the binding agent increases over
- 10 time. In contrast, the cancer is not progressing when the level of reactive polypeptide either remains constant or decreases with time.

- Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents
- 15 may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

- As noted above, to improve sensitivity, multiple ovarian carcinoma protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay.
- 20 Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

25 DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal

antibody or fragment thereof that specifically binds to an ovarian carcinoma protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection
5 reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding an ovarian carcinoma protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a
10 polynucleotide encoding an ovarian carcinoma protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding an ovarian carcinoma protein.

15 The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

Example 1Identification of Representative Ovarian Carcinoma Protein cDNAs

5

This Example illustrates the identification of cDNA molecules encoding ovarian carcinoma proteins.

Anti-SCID mouse sera (generated against sera from SCID mice carrying late passage ovarian carcinoma) was pre-cleared of E. coli and phage antigens and used at a
10 1:200 dilution in a serological expression screen. The library screened was made from a SCID-derived human ovarian tumor (OV9334) using a directional RH oligo(dT) priming cDNA library construction kit and the λ Screen vector (Novagen). A bacteriophage lambda screen was employed. Approximately 400,000 pfu of the amplified OV9334 library were screened.

15

196 positive clones were isolated. Certain sequences that appear to be novel are provided in Figures 1A-1S and SEQ ID NOs:1 to 71. Three complete insert sequences are shown in Figures 2A-2C (SEQ ID NOs:72 to 74). Other clones having known sequences are presented in Figures 15A-15EEE (SEQ ID NOs:82 to 310). Database searches identified the following sequences that were substantially identical to the
20 sequences presented in Figures 15A-15EEE.

These clones were further characterized using microarray technology to determine mRNA expression levels in a variety of tumor and normal tissues. Such analyses were performed using a Synteni (Palo Alto, CA) microarray, according to the manufacturer's instructions. PCR amplification products were arrayed on slides, with each
25 product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes and the slides were scanned to measure fluorescence intensity. Data was analyzed using Synteni's provided GEMtools software. The results for one clone (13695, also referred to as O8E) are shown
30 in Figure 3.

Example 2

Identification of Ovarian Carcinoma cDNAs using Microarray Technology

5 This Example illustrates the identification of ovarian carcinoma polynucleotides by PCR subtraction and microarray analysis. Microarrays of cDNAs were analyzed for ovarian tumor-specific expression using a Synteni (Palo Alto, CA) microarray, according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci.*
10 *USA* 94:2150-2155, 1997).

A PCR subtraction was performed using a tester comprising cDNA of four ovarian tumors (three of which were metastatic tumors) and a driver of cDNA from five normal tissues (adrenal gland, lung, pancreas, spleen and brain). cDNA fragments recovered from this subtraction were subjected to DNA microarray analysis where the
15 fragments were PCR amplified, adhered to chips and hybridized with fluorescently labeled probes derived from mRNAs of human ovarian tumors and a variety of normal human tissues. In this analysis, the slides were scanned and the fluorescence intensity was measured, and the data were analyzed using Synteni's GEMtools software. In general, sequences showing at least a 5-fold increase in expression in tumor cells (relative to normal
20 cells) were considered ovarian tumor antigens. The fluorescent results were analyzed and clones that displayed increased expression in ovarian tumors were further characterized by DNA sequencing and database searches to determine the novelty of the sequences.

Using such assays, an ovarian tumor antigen was identified that is a splice fusion between the human T-cell leukemia virus type I oncoprotein TAX (*see* Jin et al.,
25 *Cell* 93:81-91, 1998) and an extracellular matrix protein called osteonectin. A splice junction sequence exists at the fusion point. The sequence of this clone is presented in Figure 4 and SEQ ID NO:75. Osteonectin, unspliced and unaltered, was also identified from such assays independently.

Further clones identified by this method are referred to herein as 3f, 6b, 8e, 8h, 12c and 12h. Sequences of these clones are shown in Figures 5 to 9 and SEQ ID NOs:76 to 81. Microarray analyses were performed as described above, and are presented in Figures 10 to 14. A full length sequence encompassing clones 3f, 6b, 8e and 12h was
 5 obtained by screening an ovarian tumor (SCID-derived) cDNA library. This 2996 base pair sequence (designated O772P) is presented in SEQ ID NO:311, and the encoded 914 amino acid protein sequence is shown in SEQ ID NO:312. PSORT analysis indicates a Type 1a transmembrane protein localized to the plasma membrane.

In addition to certain of the sequences described above, this screen identified
 10 the following sequences:

Sequence	Comments
OV4vG11 (SEQ ID NO:313)	human clone 1119D9 on chromosome 20p12
OV4vB11 (SEQ ID NO:314)	human UWGC:y14c094 from chromosome 6p21
OV4vD9 (SEQ ID NO:315)	human clone 1049G16 chromosome 20q12-13.2
OV4vD5 (SEQ ID NO:316)	human KIAA0014 gene
OV4vC2 (SEQ ID NO:317)	human KIAA0084 gene
OV4vF3 (SEQ ID NO:318)	human chromosome 19 cosmid R31167
OV4VC1 (SEQ ID NO:319)	novel
OV4vH3 (SEQ ID NO:320)	novel
OV4vD2 (SEQ ID NO:321)	novel
O815P (SEQ ID NO:322)	novel
OV4vC12 (SEQ ID NO:323)	novel
OV4vA4 (SEQ ID NO:324)	novel
OV4vA3 (SEQ ID NO:325)	novel
OV4v2A5 (SEQ ID NO:326)	novel
O819P (SEQ ID NO:327)	novel
O818P (SEQ ID NO:328)	novel

Sequence	Comments
O817P (SEQ ID NO:329)	novel
O816P (SEQ ID NO:330)	novel
Ov4vC5 (SEQ ID NO:331)	novel
21721 (SEQ ID NO:332)	human lumican
21719 (SEQ ID NO:333)	human retinoic acid-binding protein II
21717 (SEQ ID NO:334)	human26S proteasome ATPase subunit
21654 (SEQ ID NO:335)	human copine I
21627 (SEQ ID NO:336)	human neuron specific gamma-2 enolase
21623 (SEQ ID NO:337)	human geranylgeranyl transferase II
21621 (SEQ ID NO:338)	human cyclin-dependent protein kinase
21616 (SEQ ID NO:339)	human prepro-megakaryocyte potentiating factor
21612 (SEQ ID NO:340)	human UPH1
21558 (SEQ ID NO:341)	human RalGDS-like 2 (RGL2)
21555 (SEQ ID NO:342)	human autoantigen P542
21548 (SEQ ID NO:343)	human actin-related protein (ARP2)
21462 (SEQ ID NO:344)	human huntingtin interacting protein
21441 (SEQ ID NO:345)	human 90K product (tumor associated antigen)
21439 (SEQ ID NO:346)	human guanine nucleotide regulator protein (tim1)
21438 (SEQ ID NO:347)	human Ku autoimmune (p70/p80) antigen
21237 (SEQ ID NO:348)	human S-laminin
21436 (SEQ ID NO:349)	human ribophorin I
21435 (SEQ ID NO:350)	human cytoplasmic chaperonin hTRiC5
21425 (SEQ ID NO:351)	humanEMX2
21423 (SEQ ID NO:352)	human p87/p89 gene
21419 (SEQ ID NO:353)	human HPBR11-7
21252 (SEQ ID NO:354)	human T1-227H
21251 (SEQ ID NO:355)	human cullin I

Sequence	Comments
21247 (SEQ ID NO:356)	kunitz type protease inhibitor (KOP)
21244-1 (SEQ ID NO:357)	human protein tyrosine phosphatase receptor F (PTPRF)
21718 (SEQ ID NO:358)	human LTR repeat
OV2-90 (SEQ ID NO:359)	novel
Human zinc finger (SEQ ID NO:360)	
Human polyA binding protein (SEQ ID NO:361)	
Human pleiotrophin (SEQ ID NO:362)	
Human PAC clone 278C19 (SEQ ID NO:363)	
Human LLRep3 (SEQ ID NO:364)	
Human Kunitz type protease inhib (SEQ ID NO:365)	
Human KIAA0106 gene (SEQ ID NO:366)	
Human keratin (SEQ ID NO:367)	
Human HIV-1TAR (SEQ ID NO:368)	
Human glia derived nexin (SEQ ID NO:369)	
Human fibronectin (SEQ ID NO:370)	
Human ECMproBM40 (SEQ ID NO:371)	
Human collagen (SEQ ID NO:372)	
Human alpha enolase (SEQ ID NO:373)	
Human aldolase (SEQ ID NO:374)	
Human transf growth factor BIG H3 (SEQ ID NO:375)	
Human SPARC osteonectin (SEQ ID NO:376)	
Human SLP1 leucocyte protease (SEQ ID NO:377)	
Human mitochondrial ATP synth (SEQ ID NO:378)	
Human DNA seq clone 461P17 (SEQ ID NO:379)	
Human dbpB pro Y box (SEQ ID NO:380)	
Human 40 kDa keratin (SEQ ID NO:381)	

Sequence	Comments
Human arginosuccinate synth (SEQ ID NO:382)	
Human acidic ribosomal phosphoprotein (SEQ ID NO:383)	
Human colon carcinoma laminin binding pro (SEQ ID NO:384)	

This screen further identified multiple forms of the clone O772P, referred to herein as 21013, 21003 and 21008. PSORT analysis indicates that 21003 (SEQ ID NO:386; translated as SEQ ID NO:389) and 21008 (SEQ ID NO:387; translated as SEQ ID NO:390) represent Type 1a transmembrane protein forms of O772P. 21013 (SEQ ID NO:385; translated as SEQ ID NO:388) appears to be a truncated form of the protein and is predicted by PSORT analysis to be a secreted protein.

Additional sequence analysis resulted in a full length clone for O8E (2627 bp, which agrees with the message size observed by Northern analysis; SEQ ID NO:391). This nucleotide sequence was obtained as follows: the original O8E sequence (OrigO8Econs) was found to overlap by 33 nucleotides with a sequence from an EST clone (IMAGE#1987589). This clone provided 1042 additional nucleotides upstream of the original O8E sequence. The link between the EST and O8E was confirmed by sequencing multiple PCR fragments generated from an ovary primary tumor library using primers to the unique EST and the O8E sequence (ESTxO8EPCR). Full length status was further indicated when anchored PCR from the ovary tumor library gave several clones (AnchoredPCR cons) that all terminated upstream of the putative start methionine, but failed to yield any additional sequence information. Figure 16 presents a diagram that illustrates the location of each partial sequence within the full length O8E sequence.

Two protein sequences may be translated from the full length O8E. For "a" (SEQ ID NO:393) begins with a putative start methionine. A second form "b" (SEQ ID NO:392) includes 27 additional upstream residues to the 5' end of the nucleotide sequence.

Example 3

This example discloses the identification and characterization of antibody epitopes recognized by the O8E polyclonal anti-sera.

Rabbit anti-sera was raised against E. coli derived O8E recombinant protein and tested for antibody epitope recognition against 20 or 21 mer peptides that correspond to the O8E amino acid sequence. Peptides spanning amino acid regions 31 to 65, 76 to 110, 136 to 200 and 226 to 245 of the full length O8E protein were recognized by an acid eluted peak and/or a salt eluted peak from affinity purified anti-O8E sera. Thus, the corresponding amino acid sequences of the above peptides constitute the antibody epitopes recognized by affinity purified anti-O8E antibodies.

For epitope mapping, 20 or 21 mer peptides corresponding to the O8E protein were synthesized. For antibody affinity purification, rabbit anti-O8E sera was run over an O8E-sepharose column, then antibody was eluted with a salt buffer containing 0.5 M NaCl and 20 mM PO₄, followed by an acid elution step using 0.2 M Glycine, pH 2.3. Purified antibody was neutralized by the addition of 1M Tris, pH 8 and buffer exchanged into phosphate buffered saline (PBS). For enzyme linked immunosorbant assay (ELISA) analysis, O8E peptides and O8E recombinant protein were coated onto 96 well flat bottom plates at 2 µg/ml for 2 hours at room temperature (RT). Plates were then washed 5 times with PBS + 0.1 % Tween 20 and blocked with PBS + 1 % bovine serum albumin (BSA) for 1 hour. Affinity purified anti-O8E antibody, either an acid or salt eluted fraction, was then added to the wells at 1 µg/ml and incubated at RT for 1 hr. Plates were again washed, followed by the addition of donkey anti-rabbit-Ig-horseradish peroxidase (HRP) antibody for 1 hour at RT. Plates were washed, then developed by the addition of the chromagenic substrate 3, 3', 5, 5'-tetramethylbenzidine (TMB) (described by Bos *et al.*, *J. of Immunoassay* 2:187-204 (1981); available from Sigma (St. Louis, MO)). The reaction was incubated 15 minutes at RT and then stopped by the addition of 1 N H₂SO₄. Plates were read at an optical density of 450 (OD450) in an automated plate reader. The sequences of peptides corresponding to the O8E antibody epitopes are disclosed herein as SEQ ID NOs:

394-415. Antibody epitopes recognized by the O8E polyclonal anti-sera are disclosed herein in Figure 17.

Example 4

5 This example discloses IHC analysis of O8E expression in ovarian cancer tissue samples.

For immunohistochemistry studies, paraffin-embedded formalin fixed ovarian cancer tissue was sliced into 8 micron sections. Steam heat induced epitope retrieval (SHIER) in 0.1 M sodium citrate buffer (pH 6.0) was used for optimal staining
10 conditions. Sections were incubated with 10% serum/PBS for 5 minutes. Primary antibody (anti-O8E rabbit affinity purified polyclonal antibody) was added to each section for 25 min followed by a 25 min incubation with an anti-rabbit biotinylated antibody. Endogenous peroxidase activity was blocked by three 1.5 min incubations with hydrogen peroxidase. The avidin biotin complex/horse radish peroxidase system was used along
15 with DAB chromogen to visualize antigen expression. Slides were counterstained with hematoxylin. One (papillary serous carcinoma) of six ovarian cancer tissue sections displayed O8E immunoreactivity. O8E expression was localized to the plasma membrane.

Six ovarian cancer tissues were analyzed with the anti-O8E rabbit polyclonal antibody. One (papillary serous carcinoma) of six ovarian cancer tissue samples
20 stained positive for O8E expression. O8E expression was localized to the surface membrane.

Example 5

25 This example discloses O8E peptides that are predicted to bind HLA-A2 and to be immunogenic for CD8 T cell responses in humans.

Potential HLA-A2 binding peptides of O8E were predicted by using the full-length open-reading frame (ORF) from O8E and running it through "Episeek," a program used to predict MHC binding peptides. The program used is based on the algorithm published by Parker, K.C. *et al.*, *J. Immunol.* 152(1):163-175 (1994) (incorporated by

reference herein in its entirety). 10-mer and 9-mer peptides predicted to bind HLA-0201 are disclosed herein as SEQ ID NOs: 416-435 and SEQ ID NOs: 436-455, respectively.

Example 6

5 This example discloses O8E cell surface expression measured by fluorescence activated cell sorting.

For FACS analysis, cells were washed with ice cold staining buffer (PBS/1% BSA/azide). Next, the cells were incubated for 30 minutes on ice with 10 micrograms/ml of affinity purified rabbit anti-B305D polyclonal antibody. The cells were
10 washed 3 times with staining buffer and then incubated with a 1:100 dilution of a goat anti-rabbit Ig (H+L)-FITC reagent (Southern Biotechnology) for 30 minutes on ice. Following 3 washes, the cells were resuspended in staining buffer containing prodium iodide, a vital stain that allows for identification of permeable cells, and analyzed by FACS. O8E surface expression was confirmed on SKBR3 breast cancer cells and HEK293
15 cells that stably overexpress the cDNA for O8E. Neither MB415 cells nor HEK293 cells stably transfected with a control irrelevant plasmid DNA showed surface expression of O8E (Figures 18 and 19).

Example 7

20 This example further evaluates the expression and surface localization of O8E.

For expression and purification of antigen used for immunization, O8E expressed in an E. coli recombinant expression system was grown overnight in LB Broth with the appropriate antibiotics at 37°C in a shaking incubator. The next morning, 10 ml of the overnight culture was added to 500 ml of 2x YT plus appropriate antibiotics in a 2L-
25 baffled Erlenmeyer flask. When the Optical Density (at 560 nanometers) of the culture reached 0.4-0.6 the cells were induced with IPTG (1 mM). 4 hours after induction with IPTG the cells were harvested by centrifugation. The cells were then washed with phosphate buffered saline and centrifuged again. The supernatant was discarded and the cells were either frozen for future use or immediately processed. Twenty milliliters of lysis

buffer was added to the cell pellets and vortexed. To break open the E. coli cells, this mixture was then run through the French Press at a pressure of 16,000 psi. The cells were then centrifuged again and the supernatant and pellet were checked by SDS-PAGE for the partitioning of the recombinant protein. For protein that localized to the cell pellet, the

5 pellet was resuspended in 10 mM Tris pH 8.0 , 1% CHAPS and the inclusion body pellet was washed and centrifuged again. This procedure was repeated twice more. The washed inclusion body pellet was solubilized with either 8 M urea or 6 M guanidine HCl containing 10 mM Tris pH 8.0 plus 10 mM imidazole. The solubilized protein was added to 5 ml of nickel-chelate resin (Qiagen) and incubated for 45 min to 1 hour at room

10 temperature with continuous agitation. After incubation, the resin and protein mixture were poured through a disposable column and the flow through was collected. The column was then washed with 10-20 column volumes of the solubilization buffer. The antigen was then eluted from the column using 8M urea, 10 mM tris pH 8.0 and 300 mM imidazole and collected in 3 ml fractions. A SDS-PAGE gel was run to determine which fractions to pool

15 for further purification. As a final purification step, a strong anion exchange resin such as Hi-Prep Q (Biorad) was equilibrated with the appropriate buffer and the pooled fractions from above were loaded onto the column. Each antigen was eluted off of the column with an increasing salt gradient. Fractions were collected as the column was run and another SDS-PAGE gel was run to determine which fractions from the column to pool. The pooled

20 fractions were dialyzed against 10 mM Tris pH 8.0. This material was then evaluated for acceptable purity as determined by SDS-PAGE or HPLC, concentration as determined by Lowry assay or Amino Acid Analysis, identity as determined by amino terminal protein sequence, and endotoxin level as determined by the Limulus (LAL) assay. The proteins were then vialled after filtration through a 0.22 micron filter and the antigens were frozen

25 until needed for immunization.

For generation of polyclonal anti-sera, 400 micrograms of each prostate antigen was combined with 100 micrograms of muramyldipeptide (MDP). Equal volume of Incomplete Freund's Adjuvant (IFA) was added and then mixed. Every four weeks animals were boosted with 100 micrograms of antigen mixed with an equal volume of IFA. Seven

days following each boost the animal was bled. Sera was generated by incubating the blood at 4°C for 12-24 hours followed by centrifugation.

For characterization of polyclonal antisera, 96 well plates were coated with antigen by incubating with 50 microliters (typically 1 microgram) at 4 C for 20 hrs. 250 microliters of BSA blocking buffer was added to the wells and incubated at RT for 2 hrs. Plates were washed 6 times with PBS/0.01% tween. Anti-O8E rabbit sera or affinity purified anti-O8e antibody was diluted in PBS. Fifty microliters of diluted antibody was added to each well and incubated at RT for 30 min. Plates were washed as described above before 50 microliters of goat anti-rabbit horse radish peroxidase (HRP) at a 1:10000 dilution was added and incubated at RT for 30 min. Plates were washed as described above and 100 microliters of TMB microwell Peroxidase Substrate was added to each well. Following a 15 minute incubation in the dark at room temperature the colorimetric reaction was stopped with 100 microliters of 1N H₂SO₄ and read immediately at 450 nm. All polyclonal antibodies showed immunoreactivity to the O8E antigen.

For recombinant expression in mammalian HEK293 cells, full length O8E cDNA was subcloned into the mammalian expression vectors pcDNA3.1+ and pCEP4 (Invitrogen) which were modified to contain His and FLAG epitope tags, respectively. These constructs were transfected into HEK293 cells (ATCC) using Fugene 6 reagent (Roche). Briefly, HEK293 cells were plated at a density of 100,000 cells/ml in DMEM (Gibco) containing 10% FBS (Hyclone) and grown overnight. The following day, 2 ul of Fugene6 was added to 100 ul of DMEM containing no FBS and incubated for 15 minutes at room temperature. The Fugene6/DMEM mixture was then added to 1ug of O8E/pCEP4 or O8E/pcDNA3.1 plasmid DNA and incubated for 15 minutes at room temperature. The Fugene/DNA mix was then added to the HEK293 cells and incubated for 48-72 hrs at 37°C with 7% CO₂. Cells were rinsed with PBS then collected and pelleted by centrifugation. For Western blot analysis, whole cell lysates were generated by incubating the cells in Triton-X100 containing lysis buffer for 30 minutes on ice. Lysates were then cleared by centrifugation at 10,000rpm for 5 minutes at 4 C. Samples were diluted with SDS-PAGE loading buffer containing beta-mercaptoethanol, then boiled for 10 minutes

prior to loading the SDS-PAGE gel. Protein was transferred to nitrocellulose and probed using anti-O8E rabbit polyclonal sera #2333L at a dilution of 1:750. The blot was revealed with a goat anti-rabbit Ig coupled to HRP followed by incubation in ECL substrate.

For FACS analysis, cells were washed further with ice cold staining buffer (PBS+1%BSA+Azide). Next, the cells were incubated for 30 minutes on ice with 10ug/ml of Protein A purified anti-O8E polyclonal sera. The cells were washed 3 times with staining buffer and then incubated with a 1:100 dilution of a goat anti-rabbit Ig(H+L)-FITC reagent (Southern Biotechnology) for 30 minutes on ice. Following 3 washes, the cells were resuspended in staining buffer containing Propidium Iodide (PI), a vital stain that allows for the identification of permeable cells, and analyzed by FACS.

From these experiments, the results of which are illustrated in Figures 20-21, O8E expression was detected on the surface of transfected HEK293 cells and SKBR3 cells by FACS analysis using rabbit anti-O8E sera. Expression was also detected in transfected HEK293 cell lysates by Western blot analysis (not shown).

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

20

SUMMARY OF SEQUENCE LISTING

SEQ ID NOs:1-71 are ovarian carcinoma antigen polynucleotides shown in Figures 1A-1S.

SEQ ID NOs:72-74 are ovarian carcinoma antigen polynucleotides shown in Figures 2A-2C.

SEQ ID NO:75 is the ovarian carcinoma polynucleotide 3g (Figure 4).

SEQ ID NO:76 is the ovarian carcinoma polynucleotide 3f (Figure 5).

SEQ ID NO:77 is the ovarian carcinoma polynucleotide 6b (Figure 6).

SEQ ID NO:78 is the ovarian carcinoma polynucleotide 8e (Figure 7A).

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- (a) polynucleotides recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391; and
- (b) complements of the foregoing polynucleotides.

2. A polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- (a) polynucleotides recited in any one of 1-81, 313-331, 359, 366, 379, 385-387 or 391; and
- (b) complements of such polynucleotides.

3. An isolated polynucleotide encoding at least 5 amino acid residues of a polypeptide according to claim polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- (a) polynucleotides recited in any one of SEQ ID NOs:1-81, 319-331, 359, 385-387 or 391; and
- (b) complements of the foregoing polynucleotides

4. A polynucleotide according to claim 3, wherein the polynucleotide encodes an immunogenic portion of the polypeptide.

5. A polynucleotide according to claim 3, wherein the polynucleotide comprises a sequence recited in any one of SEQ ID NOs:1-81, 319-331, 359, 385-387, 391 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide complementary to a polynucleotide according to claim 3.

7. An expression vector comprising a polynucleotide according to claim 3 or claim 6.

8. A host cell transformed or transfected with an expression vector according to claim 7.

9. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

10. A pharmaceutical composition according to claim 9, wherein the polypeptide comprises an amino acid sequence encoded by a polynucleotide that comprises a sequence recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391.

11. A vaccine comprising a polypeptide according to claim 1, in combination with a non-specific immune response enhancer.

12. A vaccine according to claim 11, wherein the polypeptide comprises an amino acid sequence encoded by a polynucleotide that comprises a sequence recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391.

13. A pharmaceutical composition comprising:

(a) a polynucleotide encoding an ovarian carcinoma polypeptide, wherein the polypeptide comprises at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-81, 319-331, 359, 385-387 or 391; and

(ii) complements of the foregoing polynucleotides; and

(b) a physiologically acceptable carrier.

14. A pharmaceutical composition according to claim 13, wherein the polynucleotide comprises a sequence recited in any one of SEQ ID NOs:1-81, 319-331, 359, 385-387, 391 or a complement of any of the foregoing sequences.

15. A vaccine comprising:

(a) a polynucleotide encoding an ovarian carcinoma polypeptide, wherein the polypeptide comprises at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391; and

(ii) complements of the foregoing polynucleotides; and

16. A vaccine according to claim 15, wherein the polynucleotide comprises a sequence recited in any one of SEQ ID NOs:1-81, 319-331, 359, 385-387 or 391.

17. A pharmaceutical composition comprising:

(a) an antibody that specifically binds to an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-81, 313-331, 359, 366, 379, 385-387 or 391; and

(ii) complements of such polynucleotides; and

(b) a physiologically acceptable carrier.

18. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to a patient an effective amount of an agent selected from the group consisting of:

(a) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of such polynucleotides;

(b) a polynucleotide encoding a polypeptide as recited in (a); and

(c) an antibody that specifically binds to an ovarian carcinoma protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;
and

(ii) complements of such polynucleotides;
and thereby inhibiting the development of ovarian cancer in the patient.

19. A method according to claim 18, wherein the agent is present within a pharmaceutical composition according to any one of claims 9, 13 or 17.

20. A method according to claim 18, wherein the agent is present within a vaccine according to any one of claims 11, 15 or 18.

21. A fusion protein comprising at least one polypeptide according to claim 1.

22. A polynucleotide encoding a fusion protein according to claim 21.

23. A pharmaceutical composition comprising a fusion protein according to claim 21 in combination with a physiologically acceptable carrier.

24. A vaccine comprising a fusion protein according to claim 21 in combination with a non-specific immune response enhancer.

25. A pharmaceutical composition comprising a polynucleotide according to claim 22 in combination with a physiologically acceptable carrier.

26. A vaccine comprising a polynucleotide according to claim 22 in combination with a non-specific immune response enhancer.

27. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 23 or claim 25.

28. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 23 or claim 26.

29. A pharmaceutical composition, comprising:

(a) an antigen presenting cell that expresses an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of such polynucleotides; and

(b) a pharmaceutically acceptable carrier or excipient.

30. A vaccine, comprising:

(a) an antigen presenting cell that expresses an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

- (ii) complements of such polynucleotides; and
- (b) a non-specific immune response enhancer.

31. A vaccine comprising:

(a) an anti-idiotypic antibody or antigen-binding fragment thereof that is specifically bound by an antibody that specifically binds to an ovarian carcinoma protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;
and

- (ii) complements of such polynucleotides; and
- (b) non-specific immune response enhancer.

32. A vaccine according to claim 30 or claim 31, wherein the immune response enhancer is an adjuvant.

33. A pharmaceutical composition, comprising:

(a) a T cell that specifically reacts with an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;
and

- (ii) complements of such polynucleotides; and
- (b) a physiologically acceptable carrier.

34. A vaccine, comprising:

(a) a T cell that specifically reacts with an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of such polynucleotides; and

(b) a non-specific immune response enhancer.

35. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to the patient an effective amount of a pharmaceutical composition according to claim 29 or claim 33.

36. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to the patient an effective amount of a vaccine according to any one of claims 30, 31 or 34.

37. A method for stimulating and/or expanding T cells, comprising contacting T cells with:

(a) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

- (ii) complements of such polynucleotides;
- (b) a polynucleotide encoding such a polypeptide; and/or
- (c) an antigen presenting cell that expresses such a polypeptide under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

38. A method according to claim 37, wherein the T cells are cloned prior to expansion.

39. A method for stimulating and/or expanding T cells in a mammal, comprising administering to a mammal a pharmaceutical composition comprising:

(a) one or more of:

(i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

complements of such polynucleotides;

(ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

(iii) an antigen-presenting cell that expresses an ovarian carcinoma polypeptide; and

(b) a physiologically acceptable carrier or excipient;

and thereby stimulating and/or expanding T cells in a mammal.

40. A method for stimulating and/or expanding T cells in a mammal, comprising administering to a mammal a vaccine comprising:

(a) one or more of:

(i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

complements of such polynucleotides;

(ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

(iii) an antigen-presenting cell that expresses an ovarian carcinoma polypeptide; and

(b) a non-specific immune response enhancer;

and thereby stimulating and/or expanding T cells in a mammal.

41. A method for inhibiting the development of ovarian cancer in a patient, comprising administering to a patient T cells prepared according to the method of claim 39 or claim 40.

42. A method for inhibiting the development of ovarian cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ T cells isolated from a patient with one or more of:

(i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian

carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

complements of such polynucleotides;

(ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

(iii) an antigen-presenting cell that expresses an ovarian carcinoma polypeptide;

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and therefrom inhibiting the development of ovarian cancer in the patient.

43. A method for inhibiting the development of ovarian cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ T cells isolated from a patient with one or more of:

(i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

complements of such polynucleotides;

(ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

(iii) an antigen-presenting cell that expresses an ovarian carcinoma polypeptide;

such that T cells proliferate;

- (b) cloning one or more proliferated cells; and
- (c) administering to the patient an effective amount of the cloned T cells.

44. A method for inhibiting the development of ovarian cancer in a patient, comprising the steps of:

- (a) incubating CD8⁺ T cells isolated from a patient with one or more of:

- (i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

- complements of such polynucleotides;

- (ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

- (iii) an antigen-presenting cell that expresses an ovarian carcinoma polypeptide;

such that T cells proliferate; and

- (b) administering to the patient an effective amount of the proliferated T cells, and therefrom inhibiting the development of ovarian cancer in the patient.

45. A method for inhibiting the development of ovarian cancer in a patient, comprising the steps of:

- (a) incubating CD8⁺ T cells isolated from a patient with one or more of:

- (i) an ovarian carcinoma polypeptide comprising at least an immunogenic portion of an ovarian carcinoma protein or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to

react with antigen-specific antisera is not substantially diminished, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

complements of such polynucleotides;

(ii) a polynucleotide encoding an ovarian carcinoma polypeptide; or

(iii) an antigen-presenting cell that expresses an ovarian carcinoma

polypeptide;

such that the T cells proliferate;

(b) cloning one or more proliferated cells ; and

(c) administering to the patient an effective amount of the cloned T cells.

46. A method for identifying a secreted tumor antigen, comprising the steps of:

(a) implanting tumor cells in an immunodeficient mammal;

(b) obtaining serum from the immunodeficient mammal after a time sufficient to permit secretion of tumor antigens into the serum;

(c) immunizing an immunocompetent mammal with the serum;

(d) obtaining antiserum from the immunocompetent mammal; and

(e) screening a tumor expression library with the antiserum, and therefrom identifying a secreted tumor antigen.

47. A method according to claim 46, wherein the immunodeficient mammal is a SCID mouse and wherein the immunocompetent mammal is an immunocompetent mouse.

48. A method for identifying a secreted ovarian carcinoma antigen, comprising the steps of:

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- (a) implanting ovarian carcinoma cells in a SCID mouse;
- (b) obtaining serum from the SCID mouse after a time sufficient to permit secretion of ovarian carcinoma antigens into the serum;
- (c) immunizing an immunocompetent mouse with the serum;
- (d) obtaining antiserum from the immunocompetent mouse; and
- (e) screening an ovarian carcinoma expression library with the antiserum, and therefrom identifying a secreted ovarian carcinoma antigen.

49. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

50. A method according to claim 49, wherein the binding agent is an antibody.

51. A method according to claim 50, wherein the antibody is a monoclonal antibody.

52. A method according to claim 49, wherein the cancer is ovarian cancer.

53. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

54. A method according to claim 53, wherein the binding agent is an antibody.

55. A method according to claim 54, wherein the antibody is a monoclonal antibody.

56. A method according to claim 53, wherein the cancer is ovarian cancer.

57. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

58. A method according to claim 57, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

59. A method according to claim 57, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

60. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

61. A method according to claim 60, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

62. A method according to claim 60, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

63. A diagnostic kit, comprising:

(a) one or more antibodies or antigen-binding fragments thereof that specifically bind to an ovarian carcinoma protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;

and

(ii) complements of the foregoing polynucleotides.; and

(b) a detection reagent comprising a reporter group.

64. A kit according to claim 63, wherein the antibodies are immobilized on a solid support.

65. A kit according to claim 63, wherein the solid support comprises nitrocellulose, latex or a plastic material.

66. A kit according to claim 63, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

67. A kit according to claim 63, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

68. A diagnostic kit, comprising:

(a) an oligonucleotide comprising 10 to 40 nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes an ovarian carcinoma protein, wherein the ovarian carcinoma protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs:1-387 or 391;
and

(ii) complements of the foregoing polynucleotides; and

(b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

69. An ovarian carcinoma polypeptide, comprising the sequence of O8E as depicted by SEQ ID NO: 392.

70. An ovarian carcinoma polypeptide, comprising the sequence of O8E as depicted by SEQ ID NO: 393.

71. An antibody epitope of O8E wherein said antibody epitope is selected from the group consisting of SEQ ID NO: 394-414 and 415.

COMPOSITIONS AND METHODS FOR THERAPY AND DIAGNOSIS OF OVARIAN
CANCER

ABSTRACT OF THE DISCLOSURE

Compositions and methods for the therapy and diagnosis of cancer, such as ovarian cancer, are disclosed. Compositions may comprise one or more ovarian carcinoma proteins, immunogenic portions thereof, polynucleotides that encode such portions or antibodies or immune system cells specific for such proteins. Such compositions may be used, for example, for the prevention and treatment of diseases such as ovarian cancer. Methods are further provided for identifying tumor antigens that are secreted from ovarian carcinomas and/or other tumors. Polypeptides and polynucleotides as provided herein may further be used for the diagnosis and monitoring of ovarian cancer.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Jennifer L. Mitcham et al.
Filed : August 10, 2000
For : COMPOSITIONS AND METHODS FOR THE THERAPY AND
DIAGNOSIS OF OVARIAN CANCER

Docket No. : 210121.462C4

Date : August 10, 2000

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

DECLARATION

Sir:

I, Monica Steinborn, in accordance with 37 C.F.R. § 1.821(f) do hereby declare that, to the best of my knowledge, the content of the paper entitled "Sequence Listing" and the computer readable copy contained within the floppy disk are the same.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated this 10th day of August, 2000.



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11729.1 contg

TTAGAGAGGCACAGAAGGAAGAAGAGTTAAAAGCAGCAAAGCCGGGTTTTTTGTTTTGT
TTTTTTTTTTTTTTTTGAGATGGAGTCTCACTCTGTTGCCAAGCTGGAGTACAACGGCA
TGATCTCAGCTCGCTGCAACCTCCGCTCCACGTTCAAGTGATTCTCCTGCCTCAGCCTCC
CAAGTAGCTGGGATTACAGGCGCCCGCCACCACGCTCAGCTAATTTTTTTTGTATTTTAGT
AGAGACAGGGTTTACCAGGTTGGCCAGGCTGCTCTTGAACCTCCTGACCTCAGGTGATCCA
CCCGCTCGGCTCCCAAAGTGCTGGGATTACAGGCGTGAGCCACCACGCCCCGGCCCCCAA
AGCTGTTTCTTTTGTCTTTAGCGTAAAGCTCTCCTGCCATGCAGTATCTACATAACTGACGT
GACTGCCAGCAAGCTCAGTCACTCCGTGGTC

11729-45.21.21.cons1

TAGGATGTGTTGGACCCTCTGTGTCAAAAAAACCTCACAAAGAATCCCCTGCTCATTACA
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TAATTATTGTGTGAGAAGAGATTGAATACCTGCTTAAGAAGCTTACAGAAGCTATGGGAG
GAGGTGGCAGCAAGAACAATTTGAACATTATAAAATCAACTTTGATGACAGTAAAAATG
GCCTTTCTGCATGGGAACTTATTGAGCTTATTGGAAATGGACAGTTTAGCAAAGGCATGGA
CCGGCAGACTGTGTCTATGGCAATTAATGAAGTCTTTAATGAACCTTATATTAGATGTGTTA
AAGCAGGGTTACATGATGAAAAAGGGCCACAGACGGAAAAACTGGACTGAAAGATGGTT
TGTAATAAAACCAACATAAATTTCTTACTATGTGAGTGAGGATCTGAAGGATAAGAAAGG
AGACATTCTCTTGGATGAAAAATCTGTGTAGAGTCCTTGCCCTGACAAAGATGGAAA

11729-45.21.21.cons2

TTAGAGAGGCACAGAAGGAAGAAGACTTAAAAGCAGCAAAGCCGGGTTTTTTGTTTTGT
TTTTTTTTTTTTTTTTGAGATGGAGTCTCACTCTGTTGCCAAGCTGGAGTACAACGGCA
TGATCTCAGCTCGCTGCAACCTCCGCTCCACGTTCAAGTGATTCTCCTGCCTCAGCCTCC
CAAGTAGCTGGGATTACAGGCGCCCGCCACCACGCTCAGCTAATTTTTTTTGTATTTTAGT
AGAGACAGGGTTTACCAGGTTGGCCAGGCTGCTCTTGAACCTCCTGACCTCAGGTGATCCA
CCCGCTCGGCTCCCAAAGTGCTGGGATTACAGGCGTGAGCCACCACGCCCCGGCCCCCAA
AGCTGTTTCTTTTGTCTTTAGCGTAAAGCTCTCCTGCCATGCAGTATCTACATAACTGACGT
GACTGCCAGCAAGCTCAGTCACTCCGTGGTC

11731.1contig

TCTTTTCTTTTGAATTTCTTCAATTTGTCAAGTTTGAATTTATGAAGTTGTTCAAGGGCTAA
CTGCTGTGTAATATAGCTTTCTCTGAGTTCTTCAAGTATGTTAAATGAATCCATTCTG
AGAGCTTAGATGCAAGTTCTTTTCAAGAGCATCTAATTTGTTCTTTAAGTCTTTGGCATAAT
TCTTCTTTTCTGATGACTTTTATGAAGTAACTGATCCCTGAATCAGGTGTGTTACTGAG
CTGCATGTTTTTAATTTCTTTCTTAAATAGCTGCTTCTCAGGGACCAGATAGATAAGCTTAT
TTTGATATTCTTTAAGCTCTTTGTGAAGTTGTTTGAATTTCCATAATTTCCAGGTTCACACTGT
TTATCCAAAACCTTCTAGCTCAGTCTTTTGTGTTTGTCTTTCTGATTTGGACATCTTGTAGTCTG
CTTACATCTGCTGATGXTTCCATTCAGTCTTCCAGTTCCAGGTGGAGACTTTCCTTTCT
GGAGCTCAGCCTGACAAATGCCCTTCTTGXTCCCT

FIG. 1A

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11731.2contig

AGCCAGATGGCTGAGAGCTGCAAGAAGAAGTCAGGATCATGATGGCTCAGTTTCCACAG
CGATGAATGGAGGGCCAAATATGTGGGCTATTACATCTGAAGAACGTAAGCATGATA
AACAGTTTGATAACCTCAAACCTTCAGGAGGTTACATAACAGGTGATCAAGCCCGTACTTT
TTTCTACAGTCAGGTCTGCCGGCCCCGTTTGTAGCTGAAATATGGGCTTATCAGATCTG
AACAAGGATGGGAAGATGGACCAGCAAGAGTTCTCTATAGCTATGAACTCATCAAGTTA
AAGTTGCAGGGCCAACAGCTGCCTGTAGTCTCCCTCCTATCATGAAACAACCCCTATGT
TCTCTCCACTAATCTCTGCTCGTTTTGGGATGGGAAGCATGCCCAATCTGTCCATTATCAG
CCATTGCCTCCAGTTGCACCTATAGCAACACCCTTGTCTTCTGCTACTTCAGGGACCAGTAT
TCCTCCCTAATGATGCCTGCTCCCTAGTGCCTTCTGTTAGTA

11734.1contig

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TTGAGTAGGTTTTCTGAGGATGCACCCCTGGCTTGAAGAGAAAGACTGGCAGGATTAACAAT
ATCTAAAATCTCACTTGTAGGAGAAACCACAGGCCACCAGAGCTGCCACTGGTGTGGCAC
CAGCTCCACCAAGGCCAGCGAAGAGCCCAAATGTGAGAGTGGCGGTGAGGCTGGCACCAG
CACTGAAGCCACCCTGGTGTCTGGCACTGGCACTGGCACTGTTATTGGTACTGGTACTGGC
ACCAGTGTCTGGCACTGGCACTCTCTTGGGCTTTGGCTTTAGCTTCTGCTCCCGCTGGATCC
GGGCTTTGGCCAGGGTCCGATATCAGCTTCTGTCAGTTGCAGGGCCCGGCAGCATTCTC
CGAGCCGAGCCCAATGCCCATTCGAGCTCTAATCTCGGCCCTAGCCTTGGCTTCAGCTGCA
GCCTCAGCTGCAGCCTTCAAATCCGCTTCCATCGCCTCTCGGTAC

11734.2contig

GCCAAGAAAGCCCCAAAGCTGAAGCATCTGGATGGGGAAGAGGATGGCAGCAGTGATCA
GAGTCAGGCTTCTGGAACCACAGGTGGCCGAAGGGTCTCAAAGGCCCTAATGCCCTCAAT
GGCCCCGAGGGCTTCAAGGGGTCCCATAGCCTTTTGGGCCCCGAGGGCATCAAGGACTCG
GTTGGCTGCTTGGGCCCCGAGAGCCTTCTCTCCCTGAGATCACCTAAAGCCCGTAGGGCC
AAGGCTCGCCGTAGAGCTGCCAAAGCTCCAGTCAATCCCAAGAGCCTGAAGCACCACCCT
CGGGATGTGGCCCTTTTGAAGGGAGGGCAATGATTTGGTGAAGTACCTTTTGGCTAAAG
ACCAGACGAAGATTCCCATCAAGCGCTGGGACATGCTGAAGGACATCATCAAAGAATACA
CTGATGTGTACCCCGAAATCATTCGAAGCAGCAGGCTATTCTTGGAGAAGGTATTTGGGAT
TCAATTGAAGGAAATTGATAAGAATGACCCTTGTACATTCTCTCAGC

11736.1contig

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TTGGTCTCCAAAAGTGCTGGGATCATAGGCGTGAGCCACCTCAGCCACCAATTTTCA
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GCTTGCCTGAGGGTGACTACAAAATGCTTGGCTAAAAGGTTAGGATGGGTAAAGAATTAG
ATTTTCTGAATGCAAAAATAAAATGTGAACCTAATGAACCTTATAGGTAATACATATTCATAAA
ATAATTATTCACATATTTCTGATTTATCACAGAAATAATGTATGAAATGCTTTGAGTTTCT
TGGAGTAAACTCCATTACTCATCCCAAGAAACCATAATTATAAGTATCACTGATAATAAGAA
CAACAGGACCTTGTCTATAAATCTCGATAAGAGAAATAGTCTCTGGGTGTTTGTCTTAAT
TGATAAAATTTACTTGTCCATCTTTTGTTCAGAAATCACAAAA

FIG. 1B

11736.2contig

AAGCGGAAATGAGAAAAGGAGGGAAAATCATGTGGTATTGAGCGGAAAACCTGCTGGATGA
 CAGGGCTCAGTCCTGTTGGAGAACTCTGGGTGGTGTGTAGAACAGGGCCACTCACAGTG
 GGGTGACAGACCAGCACGGCTCTGTGACCTGTTTGTACAGGTCCATGATGAGGTAAAC
 AATACACTGAGTATAAGGGTTGGTTTAGAACTCTTACAGCAATTTGACAAAGTAATCTTC
 TGTGCAGTGAATCTAAGAAAAAATTGGGGCTGTATTTGTATGTTCTTTTTTTCATTTTCAT
 GTTCTGAGTTACCTATTTTTATTGCATTTTACAAAAGCATCCTTCCATGAAGGACCGGAAGT
 TAAAAACAAGCAGGTCTTTATCACAGCACTGTCTGTAGAACACAGTTCAGAGTTATCCAC
 CCAAGGAGCCAGGGAGCTGGGCTAAACCAAGAATTTTGCTTTTGGTTAATCATCAGGTA
 CTTGAGTTGGAATTGTTTTAATCCCATCATTACCAGGCTGGAXGTG

11739-1&2

CCGCGGCTCCTGTCCAGACCCTGACCCTCCCTCCCAAGGCTCAACCGTCCCCCAACAACCG
 CCAGCCTTGTAAGTGTGCGGCTGCGAGAGCCTGTGCTTAAGTAAGAATCAGGCCTTATTG
 GAGACATTCAAGCAAAGGTTGGACA.AACTACTTTTCCAGAACAGAAAGGAACTCATGCAT
 CAGAAAAGGTGACTAATAAAGGTACCAGAAGAATATGGCTGCACAAATACCAGAACTCTGA
 TCAGATAAAACAGTTTAAGCAATTTCTGGGGACCTACAATAAACTTACAGAGACCTGCTTT
 TTGGACTGTGTTAGAGACTTCACAACAAGAGAAGTAAAACCTGAAGAGACCACCTGTTCA
 GAACATTGCTTACAGAAATATTTAAAAATGACACAAGAATATCCATGAGATTTACAGGAA
 TATCATATTACAGAGAATGAAGCCCTGCCAGCCAAAGCAGGACTCCTTGGCCAACCCACGA
 TAGAGAAGTCTGTATGATGAACCTTTGATGAAAGATTGCCAACAGCTGCTTTATTGGAAA
 TGAGGACTCATCTGATAGAAATCCCTGAAAGCAGTAGCCACCATGTTCAACCATCTGTAT
 GACTGTTTGGCAAAATGGAACCGCTGGAGAAACAAAATTGCTATTTACCAGGAATAATCA
 CAATAGAAGGTCTTATTGTTCACTGAAATAATAAGATGCAACATTGTTGAGGCCTTATGA
 TTCAGCAGCTTGGTCACTTGATTAGAAAAATAAACCAATTGTTTCTCAATTGTGACTGTAA
 ATTTTAAAGCAACTTATGTCTTCGATCATGTATGAGATAGAAAAATTTTATTACTCAAAG
 TAAAAATAAATGGA

11740.1.contig

GAAAAAAAAATATAAAACACACTTTTGGCAAAACGGTGGCCCTAAAAGAGCGAAAAGAATTT
 CACCAATATAAATCCAATTTTATGAAAACCTGACAATTTAATCCAAGAATCACTTTTGTAAA
 TGAAGCTAGCAAGTGATGATATGATAAAAAATAACGTGGAGGAAATAAAAAACACAAGACTT
 GGCATAAGATATATCCACTTTTGATA.TAAACTTGTGAAGCATATTCTTCGACAAATTGTG
 AAAGCGTTCCTGATCTTGCTTGTCTCCA.TTCAAATAAGGAGGCATATCACATCCCAAGA
 GTAACAGAAAAAGAAAAAGACATTTTGCATTTTGAGATGAACCAAAAGACACAAAACAA
 AACGAACAAAGTGTCATGTCTAAATCTAGCCTCTGAAATAAACCTTGAACATCTCCTACAA
 GGCACCGTGATTTTGTAAATCTAAGCTGAAGAAATGTGATGACTTTTGTGGACATGAAAA
 TCAGATGAGAAAACCTGTGGTCTTTCCAAACCGCTGAACCTCCCTGAAAACCTTTGCA

FIG. 1C

11766.1.contig

CTGGGATCATTTCTCTTGATGTCATAAAAGACTCTTCTTCTCCTCTTCATCCTCTTCTTCAT
CCTCTTCTGTACAGTGCTGCCGGGTACAACGGCTATCTTTGTCTTTATCCTGAGATGAAGAT
GATGCTTCTGTTTCTCCTACCATAACTGAAGAAATTTGCTGGAAGTCGTTTGACTGGCTGT
TTCTCTGACTTCACCTTCTTTGTCAAACCTGAGTCTTTTACCTCATGCCCTCAGCTTCCAC
AGCATCTTCATCTGGATGTTTATTTTCAAAGGGCTCACTGAGGAACTTCTGATTGAGAG
GTGGAAGAGTCACTGTGATTTTCTCCTCATTTTGTGCAAATTTGCCTCTTTGCTGTCTGT
GCTCTCAGGCAACCCATTTGTTGTCAATGGGGGCTGACAAAGAAACCTTTGGTTCGATTAAGT
GGCCTGGGTGTCCCAGGCCCAITTTATATTAGACCTCTCAGTATAGCTTGGTGAATTTCCAG
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11766.2.contig

GAGGGTTGGTGGTAGCGGCTTGGGGAGGTGCTCGCTCTGTGGTCTTGCTCTCTCCACGC
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AGGGGGAGGGCGTCCGGGGGGTGGGGGGAGGCGTTCGGTCCCCAAGAGACCCGCGGAG
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11773.2.contig

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GCCGXTGCCG

11775-1&2

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TCTTCCACATCCTCACATAGACCCAGACCCGCTGGCCCTGGCTGGGCATCGCATTTGCTG
GTAGAGCAAGTCATAGGTCTCGTCTTTGACGTACAGAAGCGATACACCAAATTCCTGGT
CGGTCAATTGTCATAACCAGAGA

FIG. 1D

11777.1&2.cons

CAGACGGGGTTTCACTATGTTGGCTAGCCTGGTCTTGAACCTCTGACTTCAGGTGATCTGC
CTGCCTTGGCCTCCCAAAGTGCTGGGATTACAGGCATAAGCCACTGCGCCCGGTGATCTG
ATGGTTTCATAAGGCTTTTCCCCCTTTTGTCTAGCACTTCTCTTCTGCGCCATGTGAAG
AAGGACATGTTTGTCTCCCTTCCACCACGATTGTAAGTTGTTTCTGAGGCCTCCCCGGCC
ATGCTGAACTGTGAGTCAATTAACCTCTTTCTTTATAAATTATCCAGTTTTGGGTATGTC
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TAGATGACATGGGCAGCCTCCCCTGAGGCCAGGTGTGGCCGAACCTGGGCAGTGTCTGCAC
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AGTGTCCCAAGCCACAGTGGCTAGGGGGACTCAGGGAACAGTTCACAGTCTGCCCTACTT
CTCTTACCTTTACCCCTCATACCTCCAAAGTAGACCATGTTTATGAGGTCCAAAGG

=

11779.2.contig

AAGCGAGGAAGCCACTGCGGCTCCTGGCTGAAAACCGCGGCCAGGCTCGGGAACAGAGG
GAACCGGAAGAACAGGACCGGAAGCTGCAGGCTGAAAGGGACAAGCGAATGCGAGAGG
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GAGGAGCAGGAGGCTCGAGACAAGCCCGCAGCCTGAGCAGGAGGAGCAGGAGCGACTGCA
GAAGCAGAAAGAGGAAGCCGAAGCCCGGTCCCGGGAAGAAGCTGACCGCCAGCGCCAGG
AGCGGGAAAAGCACTTTTCAGAAAGGACGAACAGGAGAGACAAGAGCGAAGAAAGCGGCTG
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AAAGGAGACCGCAGCTAACAAATTCGGGGCCAGACCTTTGTGAAAGCTGTAGAGACTCGGC
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11781 & 37.cons

CTCTGTGGAAAACCTGATGAGGAATGAATTTACCATTACCCATGTTCTCATCCCCAAGCAAA
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AGCAGGGCCTCATCACTGGGCTGGATTCTACTACCCACACAGACCGCGTTTCTCTC
CAGTGTGACCTACACACTCACTGCTTACCAGATGATGTTGCCAGAGTCAGTAGCCATT
GTTTGTCCCCCAAGTTCACGAAACTGGATTCTTTAAACTAACTGACCATGGACTAGAGG
AGATTTCTTCTGTGGCCAGAAAGGATTTTATCCACACACCAAGGATCCACCTCTGTTCTG
TAGCTGCAGCCACGTGACTGTTGTGGACAGAGCAGTGACCATCACAGACCTTCGATGAGC
GTTTGAGTCCAACACCTTCCAAGAACAAACAAACCATAATCAGTGTACTGTAGCCCCCTTAAT
TTAAGCTTTCTAGAAAGCTTTGGAAGTTTTGTAGATAGTAGAAAGGGGGGCATCACXTGA
GAAAGAGCTGATTTTGTATTTACGGTTTGAAGAAGAAATAACTGAACATATTTTTAGGCAA
GTCAGAAAGAGAACATGGTCACTCAAAAGCAACTGTAATCAGAAATTAAGTTACTCAGA
AATTAAGTAGCTCAGAAATTAAGAAACAATGGTATAATGAACCCCATATACCCCTTCTTC
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AATTTGTTTATATTTACCTCTGGGCTCAATAAGGGCATCTGTGCAGAAATTTGGAAGCCAT
TTAGAAAATCTTTTGGATTTTCTGTGCTTTATGGCAATATGAATGGAGCTTATTACTGGG
GTGAGGGACAGCTTACTCAATTTGACCAGATTTTGGCTAACACATCCCGAAGAATGATT
TTGTCAGGAATTATTTGTTAATTAATAATAATTCAGGATATTTTCTCTACATAAAGTAA
CAAT

FIG. 1E

11781-76-87-37

CTCTGTGGAAAAGTATGAGGAATGAATTTACCATTACCCATGTTCTCATCCCCAAGCAAA
GTGCTGGGTCTGATTACTGCAACACAGAGAACGAAGAAGAACTTTTCTCATACAGGATC
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CAGTGTGACCTACACACTCACTGCTTTACCAGATGATGTTGCCAGAGTCAGTAGCCATT
GTTTGTCCCCCAAGTTCCAGGAACTGGATTCTTTAACTAACTGACCATGGACTAGAGG
AGATTTCTTCTGTGCGCCAGAAAGGATTTTCATCCACACAGCAAGGATCCACCTCTGTTCTG
TAGCTGCAGCCACGTGACTGTTGTGGACAGAGCAGTGACCATCACAGACCTTCGATGAGC
GTTTGTGAGTCCAACACCTTCCAAGAACAACAAAACCATATCAGTGTACTGTAGCCCCCTTAAT
TTAAGCTTTCTAGAAAGCTTTGGAAGTTTTGTAGATAGTAGAAAGGGGGGCATCACCTGA
GAAAGAGCTGATTTTGTATTTTCAGGTTTGAAGAAAGAAATACTGAACATATTTTTAGGCAA
GTCAGAAAGAGAACATGGTCACCCAAAAGCAACTGTAAGTCAAGAAATTAAGTTACTCAGA
AATTAAGTAGCTCAGAAATTAAGAAAGAATGGTATAATGAACCCCATATACCCTTCCTTC
TGGATTCACCAATTGTTAACATTTTTCTCTCAGCTATCCTTCTAATTTCTCTAATTTT
AATTTGTTTATATTTACCTCTGGGCTCAATAAGGGCATCTGTGCAGAAATTTGGAAGCCAT
TTAGAAAATCTTTTGGATTTTCTGTGGTTTATGGCAATATGAATGGAGCTTATTACTGGG
GTGAGGGACAGCTTACTCCATTTGACCAGATTGTTTGGCTAACACATCCCGAAGAATGATT
TTGTCAGGAATTATTGTTATTTAATAAATATTTTCAGGATATTTTCTCTACAATAAAGTAA
CAATTA

11784-1 & 2

GGACGACAAGGCCATGGCGATATCGGATCCGAATTCAGCCCTTTGGAATTAAATAAACCT
GGAACAGGGAAGGTGAAAGTTGGAGTGACATGCTTCCATATCTATACCTTTGTGCACAGT
TGAAATGGGAAGTGTGCTTTAGGGCATCTTACAGTTGATTGATGGAAAAAGCAGACAG
GAACTGGTGGGAGGTCAAGTGGGGAAGTTGGTGAATGTGGAATAACTTACCTTTGTGCTC
CACTTAAACCAGATGTGTTCCAGCTTTCTGACATGCAAGGATCTACTTTAATTCCACACT
CTCATTAAATAAATTGAATAAAAGCGAATGTTTTGGCACCTGATATAATCTGCCAGGCTATG
TGACAGTAGGAAGGAATGGTTCCCTTAACAAGCCCAATGCACTGGTCTGACTTTATAAAT
TATTTAATAAAATGAACATAATC

11785.2.contig

GGCAGTGACATTCACCATCATGGGAACCACTTCCCTTTTCTTCAGGATTCTCTGTAGTGG
AAGAGAGCACCCAGTGTGGGCTGAAAACATCTGAAAGTAGGGAGAAGAACCTAAAATA
ATCAGTATCTCAGAGGGCTCTAAGGTGCCAAGAAGTCTCACTGGACATTTAAGTGCCAAC
AAAGGCATACTTTCCGAATCGCCAAAGTCAAACTTTCTAACTTCTGTCTCTCAGAGACA
AGTGAGACTCAAGAGTCTACTGGTTAGTGCCAACTACAGAAAAGTGGTGTACCCAGAA
AAACAGGAGCAATTAGAAATGGTTCCAAATATTTCAAAGCTCCGCAACAGGATGTGCTTT
CCTTTGCCCAATTAGGGTTCTCTCTTTCTTTCTTTATTAACCACT

FIG. 1F

TGCGCTGAAAACAACGGCCTCCTTTACTGTTAAAAATGCAGCCACAGGTGCTTAGCCGTGGG
 CATCTCAACCACCAGCCTCTGTGGGGGGCAGGTGGGCGTCCCTGTGGGGCCTCTGGGCCCAC
 GTCCAGCCTCTGTCTCTGCCTTCCGTTCTTCGACAGTGTTCCTGGCATCCCTGGTCACTTG
 GTACTTGGCGTGGGCCCTCCTGTGCTGCTCCAGCAGCTCCTCCAGGXGGTCGGCCCCGCTTCA
 CCGCAGCCTCATGTTGTGTCCGGAGGCTGCTACGGCCTCCTCCTTCCTCGCGAGGGCTGT
 CTTACCCCTCCGGXGCACCTCCTCCAGCTCCAGCTGCTGGCGGGCCTGCAGCGTGGCCAGC
 TCGGCCTTGGCCTGCCGCGTCTCCTCCTCARAGGCTGCCAGCCGGTCTCGAACTCCTGGC
 GGATCACCTGGGCCAGGTTGCTGCGCTCGCTAGAAAGCTGCTCGTTCACCGCCTGCGCATC
 CTCCAGCGCCCGCTCCTTCTGCCGCACAAGGCCCTGCAGACGCAGATTCTCGCCCTCGGCCT
 CCCCAGCTGGCCCTTACGCTCCGAGCACCGCTCCTGAAGCTTCCGCTCCGACTGCTCCAG
 CTCGGAGAGCTCGGCCTCGTACTTGTCCCGTAAGCGCTTGATGCGGCTCTCGGCAGCCTTC
 TCACTCTCCTCCTTGGCCAGCGCCATGTGGGCTCCAGCCGGTGAATGACCAGCTCAATCT
 CTTGTCCCGGCTTCCGGATTCTTCCCTCAGCTCCTGTTCCTGGTTCAGCAGCCACGCC
 TCCTCCTTCTGGTGGCGCCGGCCTCCCACGCTGCTCTCCAGCTCCAGCTGCTGCTTCAG
 GGTATTCAGCTCCATCTGGCGGGCCTCCAGCGTGGCCA

13690.4

CAACTTATTACTTGAAATTATAATATAGCCTGTCCGTTTGCTGTTTCCAGGCTGTGATATAT
 TTTCTAGTGGTTTGACTTTAAAAATAAATAAGGTTTAAATTTCTCCCC

13693.1

TGCAAGTCACGGGAGTTTATTTATTTAAATTTTCCCCACATGGAGACTCTGTGCCCCAGG
 CTGGAGTGCAATGGTGTGATCTTGGCTCACTGCAACCTCCACCTCCTGGGTTCAAGCGATT
 CTCCTGCCACAGCCTCCCGAGTAGCTGGGATTACAGGTGCCCCGCCACCACACCCAGCTAAT
 TTTTATTTTTAGTAAAGACAGGGTTTCCCCATGTTGGCCAGGCTGGTCTTGAACCTTCTGA
 CCTCAGGTGATCCACCTGGCTCGGCTTCCCAAAGTGTGGGATTACAGGCGTGAGCTACCC
 GTGCCTGCCCCAGCCACTGGAGTTTAAAGGACAGTCAATGTTGGCTCCAGCCTAAGGCGGCA
 TTTTCCCCCATCAGAAAGCCCGCGGCTCTGTACCTCAAAATAGGGCACCTGTAAAGTCAG
 TCAGTGAAGTCTCTGCTCTAACTGGCCACCCGGGCCCCATTGGCCTCTGACACAGCCTTGCC
 AGGANGCCTGCATCTGCCAAAAGAAAAGTTCACTTCTTTCCG

13694.1

CAGAGAATCTKAGAAAGATGTCCCTTTCTTTTAAATGAATCAGAGAAGCCCATTTGTATC
 CCTGAATCATTGAGAAAAGCGGGCGGTGGCGACAGCGCGGACCTAGGGATCGATCTGGAG
 GGACTTGGGGAGCGGTGCAGAGACCTCTAGCTCGAGCGGAGGGACCTCCCGCCGGGATGC
 CTGGGGACCAGATGCCACCTACTGGAAGTCAGTTGGATTACAGATTTCTCTCAGCAAGATAC
 TCTTGGCTGATAATTGAAGATTCTCAGCCTGAAAGCCAGGTTCTAGAGGATGATTCTGGT
 TCTCACTTCAGTATGCTATCTCGACACCTTCTCTAATCTCCAGACGCACAAAGAAAATCCTG
 TGTGGATGTTGNGTCCAATCCTTGAACAAACAGCTGGAGAAGAACCAGGAGACCGGTAA
 TAGTGGGTTCAATGAACATTTGAAAACAAAACCAGGTTGCAGACCTG

FIG. 1G

13694.2

GACTGTCTGAACAAGGGACCTCTGACCAGAGAGCTGCAGGAGATGCAGAGTGGTGGCAG
GAGTGGAAAGCCAAAGAACACCCACCTTCTCCCTTGAAGGAGTAGAGCAACCATCAGAAG
ATACTGTTTTATTGCTCTGGTCAAACAAGTCTTCTGAGTTGACAAAACCTCAGGCTCTGGT
GACTTCTGAATCTGCAGTCCACTTTCCATAAGTTCTTGTGCAGACAACTGTTCTTTTGCTTC
CATAGCAGCAACAGATGCTTTGGGGCTAAAAGGCATGCTCTGACCTTGCAGGTGGTGG
ATTTTGCTCTTTTACAACATGTACATCCTTACTGGGCTGTGCTGTCACAGGGATGCTCTTGC
TGGACTGTTCTGCTATGGGGATACTTCGTTGGACTGTTCTTCATGCTTAATTGCAGTATTA
GCATCCACATCAGACAGCCTGGTATAACCAGAGTTGGTGGTTACTGATTGTAGCTGCTCTT
TGCCACTTCATATGGCACAAGTATTTTCTCAACATCCTGGCTCTGGGAAG

13695.1

GAAATGTATATTTAATCATTCTCTTGAACGATCAGAACTCTRAAATCAGTTTTCTATAACAR
CATGTAATACAGTCACCGTGGCTCCAAGGTCCAGGAAGGCAGTGGTTAACACATGAAGAG
TGTGGGAAGGGGGCTGGAACAAAGTATTCTTTTCTTCAAAGCTTCATTCTCAAGGCCT
CAATTCAGCAGTCATTGTCTTGTCTTCAAAGTCTGTGTGTGCTTCATGGAAGGTATAT
GTTTGTTCCTTAATTTGAATGTGGCCAGGAAGGTCTGGAGATCTAAATTCAGAGTAAG
AAAACCTGAGCTAGAACTCAGGCATTCTCTTACAGAACTTGGCTTGCAGGGTAGAATGA
ANGGAAAGAACTTAGAAGCTCAACAAGCTGAAGATAATCCCATCAGGCATTTCCTCATAG
GCCTTGCAACTCTGTTCACTGAGAGATGTTATCCTG

13695.2

AGTCTGGAGTGAGCAAACAAGGCAACAACAARRAGAAGCCAAAAGCAGAAGGCTCCA
ATATGAACAAGATAAATCTATCTTCAAAGACATATTAGAAGTTGGGAAAATAATTCATGT
GAACTAGACAAGTGTGTTAAGAGTCATAAGTAAAATGCACGTGGAGACAAGTGCAATCCCC
AGATCTCAGGGACCTCCCCCTGGCTGTACCTGGGGAGTGAGAGGACAGGATAGTGCAATG
TTCTTTGTCTCTGAATTTTATGTTATATGCTGTAAATGTTGCTCTGAGGAAGCCCCCTGGAA
AGTCTATCCCAACATATCCAGATCTTATAATCCACAAATTAAGCTGTAGTATGTACCCTAA
GACGCTGCTAATTGACTGCCACTTCCCAACTCAGGGGCGGCTGCATTTTAGTAATGGGTCA
AATGATTCACTTTTATGATGCTTCCCAAGGTGCCTTGGCTTCTCTCCCAACTGACAAATG
CCCAAGTTGACAAAATGATCATAATTTAGCATAAACCGAGCAATCGGGGACCCC

13697.1

TAGCTGTCTTCTCACTCTTATGGCAATGACCCCATATCTTAATGGATTAAGATAATGAAA
GTGATTTCTTACACTCTGTATCTATCACCAGAAAGCTGAGGTGATAGCCCGCTTGTCAATTGT
CATCCATATTCTGGGACTCAGCGGGGAATTTCTGGAATATTGCCAGGGACCATGGCAGA
GGGGCACAGTGCAATCTGGGGGAATGCACATTGGCTCAGCCTGGGTAAATGAGTGATATAC
ATTACCTCTGTTCACTCAATTTGGCCAGCACCAGTCAACAAGGCCCCACCAAAATACCAGAG
CGCAAGAAATGTAGTCTGTTGATATGCTTTTCTGTGTCCCAACCCAAATCTCATCTTGA
ATTGTAAGCTCCCATAAATCCCATGTGTTGTGGGAGGGACCTGGTG

FIG. 1H

13695.1.13695.2.13697.1

13697.2

ATCATGAGGATGTTACCAAAGGGATGGTACTAAACCAATTGTATTGCTCTGTTTTCACT
GCTTTGAAGATACTACCTGAGACTGGGTAATTTATAAAACAAAAGAGATTTAATTGACTCAC
AGTTCTGCAATGGCTGAAGAGGCTCAGGAACTTACAGTCATGGTGGAAGGCAAAGGAGG
AGCAAGGCATGTCTTACATGTCAGTAGGAGAGAGAGCGAGAGCAGGAGAACCTGCCACTT
ATAAACCAATTCAGATCTCATAACTCCCTATCATGAGAAAAACATGGAGGAAACCACCTC
ATGATCCAATCACCTCCCGCCAGGTCCTCCCTCGACACGTGGGGATTATAATTGAGGATT
AGAGGGACACAGAGACAAACCATATCATCAITTCATGAGAAATCCACCCTCATAGTCCAAT
CAGCTCCTACCAGGCCCCACCTCCAACACTGGGGATTGCAATTCAACATGAGATTGGATG
GGGACACAGATTCAAACCATATCATAC

13699.1&2

CATGGCCTTTCTCCTTAGAGGCCAGAGGTGCTGCCCTGGCTGGGAGTGAAGCTCCAGGCAC
TACCAGCTTTCTGATTTTCCCGTTTGGTCCATGTGAAGAGCTACCACGAGCCCCAGCCTCA
CAGTGTCCTCAAGGGCAGCTTGGTCTCTTGTCTGCGAGAGGCAGGCTGGTGTGACCCT
GGGAACCTTGACCCGGGAACAACAGGTGGCCAGAGTGAGTGTGGCCTGGCCCTCAACCT
AGTGTCCGTCTCTCTCTCTGACCCAGTCTTGAGTTAAAGGCCATTAAGTGTAGATA
CAAGCTCCTTGTGGCTGGAAAAACACCCCTCTGCTGATAAAGCTCAGGGGGCACTGAGGA
AGCAGAGGCCCCCTTGGGGGTGCCCTCCTGAAGAGAGCGTCAGGCCATCAGCTCTGTCCCTC
TGGTGTCTCCACGTCTGTCTCCTCACCTCCATCTCTGGGAGCAGCTGCACCTGACTGGCCAC
GCGGGGGCAGTGGAGGCACAGGCTCAGGCTGGCCGGGCTACCTGGCACCCCTATGGCTTAC
AAAGTAGAGTTGGCCCACTTCTCTCCACCTGAGGGGAGCAGTCTGACTCCTAACAGTCTT
CCTTGGCCTGCCATCATCTGGGGTGGCTGGCTGTCAAGAAAGGCCGGGCAATGCTTTCTAAA
CACAGCCACAGGAGCTTGTAGCCCATCTTCCAGGTGGGGAAACAGTCTTAGATAAGTAA
GGTCACTTGCCTAACCCCTCCAGCACCTTGTATCTGGAGTCTCACAGCAGACTGCATGT
SAACAACCTGGAACCGAAAACATGCCCTCAGTATAAAA

13703.3

CCAGAACCTCCTTCTCTTTGGAGAAATCCCGAGGCCTCTTGGAGACACAGAGGGTTTCACCT
TGGATGACCTCTAGAGAAAATGCCCAAGAACCCACCTTCTGGTCCCAACCTGCAGACCCC
ACAGCAGTCAGTTGGTCAGCCCTCTCTAGAAAGTCACTTGGCTCCATTGGCTGCTTCCA
ACCAATGGGCAGGAGAGAAAGGCTTTATTTCTGCCCCACCCATTCTCCTGTACCAGCACCT
CCGTTTTACGTCAGYGTGTCCAGCAACGGTACCGTTTACACAGTCA

13705.1

TGCATGTAGTTTTATTTATCTCTTTTSGTCTGGAAAACCAAGTGTCCCAGCAGCATGACTGA
ACATCACTCACTTCCCTACTTGATCTACAAGGCCAACGCCGAGAGCCCAGACCAGGATTG
CAAACACACTCCACGAGAAATTTGTGGATCCCGTGTACAGTAAGTGTCCGTCAGTACCCCA
RACGCTGTTACGTGGCAGATGACTGTACAGTGCCACGTAACAGCAGTGTACTTTTCTCCCA
TGAACAGTTACCTGCCATGTATCTACATGATTCAGAACATTTTGAACAGTTAATTCTGACA
CTTGAATAATCCCATCAAAAACCGTAAATCACTTTGATGTTTGTAAACGACAACATAGCAT
CACTTTACGACAGAAATCATCTGGAAAAACAGAACGAATACATACATCTTAAAAAATG
CTGGGGTGGGCCAGGCACAGCTTACGGCTGTAAATCCAGCAGTTTGGGAGGCTTAAGCG
GGTG

FIG. 11

13705.2

TGGGGCGGAAAGAAGCCAAGGCCAAGGAGCTGGTGGCGGCAGCTGCAGCTGGAGGCCGAG
GAGCAGAGGAAGCAGAAGAAGCGGCAGAGTGTGTGGGGCCTGCACAGATACCTTCACTTG
CTGGATGGAAATGAAAAATTACCCGTGTCTTGTGGATGCAGACGGTGATGTGATTTCTTCC
CACCAATAACCAACAGTGAGAAGACAAAGGTTAAGAAAAACGACTTCTGATTTGTTTTGG
AAGTAACAAGTGCCACCAGTCTGCAGATTTGCAAGGATGTCATGGATGCCCTCATTCTGAA
AATGGCAAGAAATGAAAAAGTACACTTTAGAAAAATAAGAGGAAGGATCACTCTCAGAT
ACTGAAGCCGATGCAGTCTCTGGACAACCTCCAGATCCCACAACGAATCCCAGTGCTGGA
AAGGACGGGCCCTTCTTCTGGTGGTGGAAACANGTCCCGGTGGTGGATCTTGGAANGGAA
CCTGAANGTGGTGTACCCCGTCCAAGGCCGACCTTGGCCAC

13707.4

TCCCGCGCTCGCAGGGCNCGTGCCACCTGCCYGTCCGCCCGCTCGCTCGCTCGCCCGCCG
GCCGCGCTGCCGACCGYCAGCATGCTGCCGAGAGTGGGCTGCCCGCGCTGCCGCTGCCG
CCGCCCGCGCTGCTGCCGCTGCTGCCGCTGCTGCTGCTGC

13708.1&2

GGCGGGTAGGCATGGAACTGAGAAACAAGGAAGCTTTCAGACTACGTGGGGAAGAAT
GAAAAAACCAAAATTATCGCCAAAGATTACGAAACGGGACAGGGAGCTCCAGCCCGAGA
GCCTATTATTAGCAGTGAGGAGCAGAACCAGCTGATGCTGTACTATCACAGAAGACAAGA
GGAGCTCAAGAGATTGGAAGAAATGATGATGATGCCTATTTAAACTCACCATGGGCGGA
TAACACTGCTTTGAAAACACATTTTCATGGAGTGAAAGACATAAAGTGGAGACCAAGATG
AAGTTCACCACCTGATGACACTTCCAAAGAGATTAGCTCACCT

13709.1

TCTGAAGGTTAAATGTTTCATCTAAATAGCGGATAATGRTAAACACCTATAGCATAGAGTTG
TTTGAGATTAATGAGATAATACATCTAAAAATTATGTGCCTGGCATACAGCAAGATTGTTG
TTGTTGTTGATGATGATGATGATGATGATAATATTTTTCTATCCCCAGTGACAACTGCTTG
AACCTATTAGATAATCAATACATGTTCTTCAACTGAGATCAATTTCCCCATGTTGTCTGAC
TGATGAAGCCCTACATTTTCTCTAGAGGAGATGACATTTGAGCAAGATCTTAAAGAAAAT
CAGATGCCTTACCTGACCACTGCTTGGTGATCCCATGGCACTTTGTACATCTCTCCATTAG
CTCTCATCTCACCAGCCCATCATTATTGATGTGCTGCCTTCTGAAGCTTGCAGCTGGCTAC
CATCMGGTAGAATAAAAAATCATCTTTTCATAAAATAGTGACCCTCTTTTTTATTGCAATT
CCCAAAGCCAAGCACCGTGGGANGGTAG

FIG. 1J

13709.2

TATGAAGAAGGGAAAAGAAGATAATTTGTGAAAGAAATGGGTCCAGTTACTAGTCTTTGA
AAAGGGTCAGTCTGTAGCTCTTCTTAATGAGAATAGGCAGCTTTCAGTTGCTCAGGGTCAG
ATTTCTTAGTGGTGTATCTAATCACAGGAAACATCTGTGGTTCCTCCAGTCTCTTTCTGG
GGGACTTGGGCCCCACTTCTCAATTCATTAATTAGAGGAAATAGAACTCAAAGTACAATTT
ACTGTTGTTTAAACAATGCCACAAAGACATGGTTGGGAGCTATTTCTTGATTTGTGTAATAAT
GCTGTTTTTGTGTGCTCATAATGGTTCCAAAAATTTGGGTGCTGGCCAAAGAGAGATACTGT
TACAGAAGCCAGCAAGAAGACCTCTGTTCAATCACACCCCCGGGGATATCAGGAATTGAC
TCCAGTGTGTGCAAATCCAGTTTGGCCTATCTTCT

13712.1&2

TGAGGGACTGATTGGTTTTGCTCTCTGCTATTEAATTCCCCAAGCCCACTTGTTCTGTCAGCG
TCCTCCTTCTCAATCCCTTTAGTTGTACCTCTCTTTTCATCTGAGACCTTTCCTTCTTGATGT
CGCCTTTTCTTCTTCTGCTTTTTCTGATGTTCTGCTCAGCATGTTCTGGGTGCTTCTCATCT
GCATCATTCCTTTCAGATGCTGTAGCTTCTTCTCTCTTCTGCTCCTTTTCTTTTCTTTT
TTTTGGGGGGGCTTCTCTGCTGCTGAGTTGAGGGGGCCCCAGGGTCTGGCCTTTTGAGACG
AGCCAGGAAGGGCTGCTCCTGGGCTCTAGCCGAGCAAGCTTGGCCTTCAATGTGATCCCA
AGACGGGCAGCCTTGTGTGCTGTTGGCCCTCACAGGCTTGGAGCAGCATCTCATCAGTCA
GAATCTTTGGGGACTTGGACCCCTGGTTGTGCTCATCACTGCAGCTCTCCAAGTCTTTGTTT
GGCTTCTCTCCACCTGAAGTCAATGTAGCCATCTTCACAACTTCTGATACAGCAAGTTGG
GCTTGGGATGATTATAACGGGTGGTCTCTTAGAAAGGCTCCTTATCTGTACTCCATCCTG
CCCAGTTTCCACTACCAAGTTGGCCCGAGTCTTGTGGAAGAGCTCATTCACCAGTGGTTT
GTGAACCTCTTGGCAGGCTCATGTCTACCCCATGAGTGTCTTCTTCAAGYTCCACCCTGA
GAGCCTGAGTGATACCAATCTCTCTCCG

13714.1&2

GACAACATGAAATAAATCCTAGAGGACAAAATTAAGTCAATAGAGTGAGTCTAGTTAA
AAACTCGAAAAATGAGCAAGTCTGGTGGGAGTGGAGCAAGGGCTATACTATAAATCCAAG
TGGCCCTCCTGATCTTAACAAGCCATGCTCATATACACATCTCTGAAGTGGACATACCAC
CTTACGCAGGAAACAGGGCTTGGAACTTCTAAGGGAAATTAACATGCACCACCCACATC
TAACCTACCTGGCCGGTAGGTACCATCCCTGCTTCGCTGAAATCAGTGCTC

13716.1&2

TTGGAATTAATAAATCCTGGAACAGGCAAGCTGAAAGTTGGAGTGAGATGTCTTCCATAT
CTATACCTTTGTGCACAGTTGAATGGCACTGTTTGGGTTTAGGCCATCTTAGAGTTGATT
GATCGAAAAACCAGACAGGAAGTGGTGGGAGGTCAGTGGGGAAAGTTGGTGAATGTGGA
ATAACTTACCTTTGTGCTCCACTTAAACCAGATGTGTTGCAGCTTTCCTGACATGCAAGGA
TCTACTTTAATCCACACTCTCATTAATAAATTGAATAAAAGGGAATGTTTTGGCACCTGA
TATAATCTGCCAGGCTATGTGACAGTAGGAAGGAATGGTTTCCCTAACAAGCCCAATGC
ACTGGTCTGACTTTATAAATAATTAATAAATAAATGAAGTATTATC

FIG. 1K

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13718.2

AAACTGGACCTGCAACAGGGACATGAATTTACTGCARGGTCTGAGCAAGCTCAGCCCCTCT
ACCTCAGGGCCCCACAGCCATGACTACCTCCCCAGGAGCGGGAGGGTGAAGGGGGCCTG
TCTCTGCAAGTGGAGCCAGAGTGGAGGAATGAGCTCTGAAGACACAGCACCCAGCCTTCT
CGCACCAGCCAAGCCTTAAGTGCCTGACCTGAACCAAGCCAGCTGAAGTGGCCC
TCCAAGGGACAGGAAGGCTGGGGGAGGGAGTTTACAACCAAGCCATTCCACCCCCTCCC
CTGCTGGGGAGAATGACACATCAAGCTGCTAACAATTGGGGGAAGGGGAAGGAAGAAAA
CTCTGAAAACAAAATCTTGT

13722.3

CATGCGTTTCACCACTGTTGGCCAGGCTGGTCTCGAACTCCTGGCCTCAAGCAATCCACCC
GCCTCAGCCTCCAAAAGTGTGGGATTACAGATGTGAGCCATGGCACCATGCCAAAAGGC
TATATTCCTGGCTCTGTGTTTCCGAGACTGCTTTTAATCCCACTTCTCTACATTAGATTA
AAAAATATTTTATTCATGGTCAATCTGGAACATAATTACTGCATCTTAAGTTTCCACTGAT
GTATATAGAAGGCTAAAGGCACAATTTTTATCAAATCTAGTAGAGTAACCAACATAAAA
TCATTAATTACTTTCAACTTAATACTAATTGACATTCTCAAAGAGCTGTTTTCAATCCT
GATAGGTTCTTTATTTTTTCAAAATATATTGGCCATGGGATGCTAATTGCAATAAGGCGC
ATAATGAGAATACCCCAAACTGGA

13722.4

GTTGACCCCCAGGGACTGGAAGACACTCTTCCCCGAGCTGTGGCGGGAGAAGCTGAT
GTTCTTTTTTATTATGCTTCTGCATCCGAATTGATGAGATGTTTGTGGGTGTGGGAGCCAG
CCGTATCAGAAATCTTTTACGGAAGCAAGCGGAATGCTCCTTGTGTTATATTTATTGAT
GAATTAGATTCTGTTGGTGGGAGAGCAATTGAATCTCCAATGCCATCCATTTCAAGGCAGA
CCATAAATCAACTTCTTGCTGAAATGGATGGTTTTAAACCCAATGAAGGAGTTATCATAAT
AGGAGCCACAAACTTCCCAGAGGCATTAGATAATGCCTTAATACCGTCTGGTCTGTTTTGA
CATGCAAGTTACAGTTCCAAGCCAGATGTAAAAGGTGCAACAGAAATTTTGAATGGTA
TCTCAATAAAATAAAGTTTGTCAATCCCGTTGATCCAGAAATTATAGCCTCGAGGTACTG
GTGGCTTTTCCCGAAGCAGAGTTGGGAGAATCTT

13724-13698-13748

GCCTACAACATCCAGAAAGAGTCTACCCCTGCACCTGGTCTSCGTCTCAGAGGTGGGATGC
AGATCTTCGTGAAGACCCCTGACTGGTAAGACCATCACTCTCGAAGTGGAGCCGAGTGACA
CCATGAGAACGTCAAAGCAAAGATCCARGACAAGGAAGGCRTYCCTCCTGACCAGCAGA
GGTTGATCTTTCCCGAAAGCAGCTGGAAGATGGDCCGACCCCTGTCTGACTACAACATCC
AGAAAGAGTCYACCCTGCACCTGGTCTCCGTCTCAGAGGTGGGATGCARATCTTCGTGA
AGACCCCTGACTGGTAAGACCATCACCTCGAGGTGGAGCCCAGTGACACCATCGAGAATG
TCAAGGCAAAGATCCAAGATAAGCAAGGCATCCCTCCTGATCAGCAGAGGTTGATCTTTG
CTGGGAAACAGCTGGAAGATGCACCCACCCCTGTCTGACTACAACATCCAGAAAGAGTCCA
CTCTGCACTTGGTCTCGGCTTGAGGGGGGGGTGTCTAAGTTTCCCTTTTAAGGTTTCMAC
AAATTTCAATTGCATTTCTTTCAATAAAGTTGTTGCATTCCC

FIG. II

000780-7039E960

13730.1

GAACTGGGCCCTGAGCCCAAGTCATGCCCTGTGTCCGATCTGCCGTGTACCTCTGTGCC
TGCCCCCTCACCCCTCCCTCCTGGTCTTCTGAGCCAGCACCATCTCCAAATAGCCTATTCCCTT
CCTGCAAATCACACACATGCGGGCCACACATACCTGCTGCCCTGGAGATGGGGAAGTA
GGAGAGATGAATAGAGGGCCATACATTGTACAGAAGGAGGGGCAGGTGCAGATAAAAGC
AGEAGACCCAGCGGCAGCTGAGGTGCAATGGAGCACGGTTGGGGCCGGCATTGGGCTGAGC
ACCTGATGGGCCTCATCTCGTGAATCCTCGAGGCAGCGCCACAGCAGAGGAGTTAAGTGG
CACCTGGGCGGAGCAGAGCAGGAGACTGAGGGTCAGAGTGGAGGCTAAGCTGCCCTGGA
ACTCCTCAATCTTGCTGCCCCCTAGTATGAAGCCCCCTTCTGCCCTACAATTCTGA

13732.1

ATGGATCTTACTTTGCCACCCAGGTTGGAGTGCAGTGCTGCAATCTTGGCTCACTGCAGCC
TTAACCTCCCAGGCTCAAGCTATCCTCCTGCCAAAGCCTTCCACATAGCTGGGACTACAGG
TACACNGCCACCACACCCAGCTAAAATTTTGTATTTTTTGTAGAGACGGGATCTCGCCAC
GTTGCCCAGGCTGGTCCCATCCTGACCTCAAGCAGATCTGCCACCTCAGCCCCCAACGT
GCTAGGATTACAGGCGTGAGCCACCGCACCCAGCCTTTGTTTTGCTTTAATGGAATCACC
AGTCCCCCTCCGTGTCTCAGCAGCAGCTGTGAGAAATGCTTTGCATCTGTGACCTTTATGA
AGGGGAACCTCCATGCTGAATGAGGGTAGGATTACATGCTCCTGTTTCCCGGGGGTCAAG
AAAGCCTCAGACTCCAGCATGATAAGCAGGGTGAG

13732.2

ATACGGGCTTTAAGGAGGGAATTCAGCTTCAATGAGGTGCTAAGGCCAGGGCTCTTATCC
AGTAAGACTGGGGTCTTACATGAGAAAGAGACACCCGAGGTCTTCTCTGCGGTGTG
AGGATGCATCAAGAAGGCGGGCGGTCTGCAAGCGAAGGAGAGGCCCGCACCAGAAACCGAC
ACCTTCATCTTGGACTTGCAGGCTCTAGAAGTGAAGAAATAACTGTCTGTTGGTTAAGCCA
CCCAGTTTGTAGTATTTCTTTATGGCTTCTTAAGCAGACTAACAAACAAACACCCAAAATT
AACTGATGGCTTCGCTGTCTTCTGTAAAAATTGCTATGAGAGAACTTTTCACTCACTGTTTT
GCAGTTTCTCCCTCAGTCCCTGGTTCTTCTCTCACATAATCCCAATTCAATTTATAGTTC
ATGGCCCAGGCAGAGTCATTCAACGGCATCTCCTGAGCTAAACCAGCACCTCCTCTGCT
CACTTCTTGACTGGCTGCTCATCAAGCCCTCTTGCAGAGATTTCATTTCTCCCGTGCCA
GGTACTTCACGCACCAAGCTCA

FIG. 1M

13735.1

GGATAATGAAGTTGTTTTATTTAGCTTGGACAAAAAGGCATATTCCTCTATTTTCTTATACA
ACAAATATCCCCAAAAATAAGCAAGCATATATATCTTGAATGTGTAATAATCCAGTGATA
AACAAGAGCAGTACTTTAAAAAGAAAAAAATATGTATTTCTGTCAAGTTAAAAATGAGAA
TCAAAACCATTACTCTGCTAACTCATTATTTTTGCTTTCTTTTTGGTTAAGAGAGGCCAAT
GCAATACACTGAAAAAGGTTTTATCTTATCTGGCATTGGAATTAGACATATTCAAACCCC
AGCCCCCATTTCCAACTTTAAGACCACAAACAAGTAATTTACTTTTCTGAACATTGGTTTT
TTCTGGAAAAATGGGAATTATAAAATAGACTTTGCAGACTCTTATGAGATTAAATAAGATA
ATGTATGAAATTTCTTTCTTTTTTACTTCTTTTCTTTTCTTTTGGAGATGGAGTCTCACCCCGT
CACCCAGGCTGGAGTACAGTG

13735.2

CCACTGCACTCCAGCCTGGGTGACGGAGTGAGACTCTGTCTCAAAAAACAAACAAACAA
ACAAACAAAAAACTGAAAAGGAAATAGAGTTCTCTTTCTCATATATGAATATATTATTT
CAACAGATTGTTGATCACCTACCATATGCTTGGTATTGTTCTAATTGCTGGGGATACAGCA
AGAGGTTCTGCAGAACTTCATGGAGCATGAAAGTAAATAAAACAAAGTTAATTTCAAGGCC
AGGCATGGTTGCTCACACCTTTAGTCCCAGCACTTTGGGAGGCTGAGGCCAGGTGGATCACT
TGGGCCCAGGAGTTCAAGGCTGCAGTGAGCCAAGATTGTGCCACTACTCTCCAGGCTGGG
CAACAGAGCAAGACCTGTCTCAGCGGGAACAAAAAGTTAATTTAGATTGTTTAAAGTG
CTGTAAGGAAGTAAATAGCTTGATAATCAAGAGAGCACCTGAAGGCCAGGCGTGGTGGC
TCACGCCTGTGGTCTAACGCTTTGGGAAGCCCGAGCGGCGGATCACAAAGTCAAGGAGAA
TTTTGGCCAGGCATGGTG

13736.1

AGAATCCATTTATTGGGTTTTAACTAGTTACACAACCTGAAATCAGTTTGGCACTACTTTA
TACAGGGATTACGCTGTGTATCCCGACACTTAAATACTGTACCAGGACCCTGCTGTGCT
TAGGTCTGTATTCACTCACTCAGCATGTAGATACTAAAAATATACTGTAGTGTCTCTTAA
GGAAGACTGTACAGCGTGTGTGCAAGATGACATTCACCAATTTGTGAATTATTTCAACCC
AGAAGATACCTTTCACTCTATAAATCTGTATAGGCAAAACATGTGGTGTAGCAATGAGAG
ATGCACACAAAAATGTTACATAAAAGTTGAGACATCTAATGATAAGTGAACCTCAAAAAA
AAAAAAACCCCATCTCAATTTTGTAAACAAGATAAAGAAAAATAATTTAAAAACACAAA
AAATGGCATTCACTGGGTACAAAGCC

13737.1&2

CAAAATATTAATATAAATCTTTGAAACAAGTTCAAGKGAATAAAAAATCAAAGTTTGCAA
AAACGTGAAGATTAACTTAATTTGTCAAAATATTCCTCATTTGCCCCAAATCAGTATTTTTTTA
TTTCTATGCAAAAGTATGCCCTCAAACTGCTTAAATGATATATGATATGATACACAAACCA
GTTTTCAAAATAGTAAAGCCAGTCACTTTGCAATTTGTAAGAAATAGGTAAAAGATTATAAG
ACACCTTAC
AATTTGGCCTCTCCTAAAATAAGAACATGAAGACCTTAATTTGCTGCCAGGAGGGAACAC
TGTGTACCCCTCCCTACAATCCAGGTAGTTTCTTTAATCCAATAGCAAATCTGGGCATAT
TTGAGAGGAGTGATTCTGACAGCCACGTTGAAATCCTGTGGGGAACCAATTCATGTCCACC
CACTGGTGGCCTGAAAAAATGCCAATAATTTTTCGCTCCCCTTCTGCTGCTGTCTCTTCCA
CATCCTCACATAGACCCAGACCCGCTGGCCCTGGCTGGGCATCGCAATGCTGGTAGAGC
AAGTCATAGGTCTCGTCTTTGACGTCAAGAACGATACACCAAAATGCTGGTGGTCAI
TGTCAATACCAG

FIG. 1N

TITGACTTTAGTAGGGGCTGAACTATTTATTTTACTTTGCCMGTAATATTTARACCYTATA
TATCTTTCAATTATGCCATCTTATCTTCTAATGBCAAGGGAACAGWTGCTAAMCTGGCTTCT
GCATTWATCACATTAAAAATGGCTTCTTGGAAAAATCTTCTTGATATGAATAAAGGATCTT
TTAVAGCCATCATTTAAAGCMGGNTTCTCTCCAACACGAGTCTGCTASGGGGGGKGAGCT
GTGAACTCTGGCTGAAGGCTTTCCCATACACACTGCAATGACMTGGTTTCTGACCAGBGTG
AGTAA

AGAGAAGCCCCATAAATGCAATCAGTGTGGGAAGGCCCTTCAGTCAGAGCTCAAGCCTTTT
CCTCCATCATCGGGTTCATACTGGAGAGAAACCCCTATGTATGTAATGAATGCGGCAGAGCC
TTTGGTTTTAACTGTCATCTTACTGAACACGTAAGGATTCACACAGGAGAAAAACCCCTATG
TTTGTAAATGAGTGGCGCAAAAGCCTTTCGTCCGAGTTCCACTCTTGTTTCAGCATCGAAGAGT
TCACACTGGGGAGAAGCCCTACCAGTGCGTTGAATGTGGGAAAGCCTTCAGCCAGAGCTC
CCAGCTCACCCCTACATCAGCCGAGTTTCACACTGGAGAGAAGCCCTATGACTGTGGTGAAGT
TGGAAGGCCCTTCAGCCGGAGGTTCAACCCCTATTAGCATCAGAAAGTTTCACAGCGGAGA
GACTCGTAAGTGACAGAAAACATGGTCCAGCCTTTGTTTCATGGCTCCAGCCTCACAGCAGAT
GGACAGATTCCTTACTGGAGAGAAGCACGGCAGAACCCTTTAACCATGGTGCAAAATCTCAT
CTGCGCTGGACAGTTC

GAGACAGGGTCTCACTTTGTCAACCAGCCTGGAAATGCAGTGGTGGCATCTTACGTAGCTCA
CTGCAGCCCTGACCTCCTGGACTCAAAACAATTCTCTGCCTCAGCCCTGCAAGTAGCTGGG
ACTGTGGGTGCATGCCACCATGGCTCCCTCAACTTTTGTAGTTTTTGTAAAGCATGGGGTTTT
GCCATGTTGCACATCCTGGTCTTGAACCTCTGAGCTCAAACGATCTGCCACCTCGGCCTC
CCAGAATGTTGGGATTACAGGGGTAAACCAACCGCCTGGCCCCATTAGGGGTAATCTTAGC
ATCCACTTGGCTCACTGAGATAATCATAAAGAGATGATAAGCACTGGAAGAAAAAATTTTT
ACTAGGCTTTGGATATTTTTTCCCTTTTACAGCTTTATACAGGAGGATTGGATCTTTAGTTTTT
CTTTAACTGATAATAAAACATTGAAGGAAAATAAGTTTACCTGAGATTCACAGAGATAAC
CGGCACTCACTCCCTTGGCTCAATTCAGTCTTTACCACATCAATTATTTTACAGAGTGACGA
TAAAGGCCCTTTAGTCTGCTTGGCACTTTTCTCCACTTTTTTGTAAACCTGTTGGCTGACA
AATGGAATTGACAGCGGATGCCATGACTATTCATTGTGTCAGGCATACGGCTGTCAATTTT
CCACCAATCCCTTGTCTCTCTTGGAGAGATCTTCTTATCAGCTAGTCCTTTGGCAAAAGTA
ATTGCAACTTCTTCTAGGTAATCTATTCCTCGTTCCACTGCTGGAACCCCTGGGACCAGGA
CTAAAACTCCAG

ATCTCATATATATATTTCTTCTCTGACTTTATTTGCTTGCTTCTGNCACGCCATTTAAAAATATC
ACAGAGACCAAAAATAGACCGGCTTTCTGGTGGAAACGCATGGCAGTCACAGGACAAAATAC
AAA¹ACTAGGGGGCTCTGTCTTCTCATACATCATACAATTTTCAAGTATTTTTTTTATGTACA
AAGAGCTACTCTATCTGAAAAAAAATAAAAAATAAATGAGACAAGATAGTTTATGCATC
CTAGGAAGAAAGAATGGGAAGAAAGAACGGGGCAGITGGGTACACATTCCTGTCCCCCTGT
TCCCAGGGACCACTACCTTCTCTGCCACTGAGTTCCCCACAGCCTCACCCATCATGTCACA
GGGCAAGTGCCAGGGTAGGTGGGGACCACTGGAGACAGCAACCAACATACTTTGGC
CTGGAAGATAAGGAGAAAGTCTCAGAAACACACTGGTGGGAAGCAATCCACNGGCCGT
GCCCCANGAGCTTCCACCTGCTGCTTCCCTGGGTGGCTTTGGGAACAGCTTGGGCAG
GCCCTTTTGGGTGGGGNCCA²ACTGGGCCTTGGCCCCGTGTGGAAAG

15

13742.1

AAACATTGAGATGGAATGATAGGGTTTCCCAGAATCAGGTCCATATTTTAACTAAATGAA
AATTATGATTTATAGCCTTCTCAAATACCTGCCATACTTGATATCTCAACCAGAGCTAATTT
TACCTCTTTACAAAATTAATAAGCAAGTAACTGGATCCACAATTTATAATACCTGTCAATT
TTTTCTGTATTAAACCTCTATCATAGTTTAAAGCCTATTAGGGTACTTAATCCTTACAAATAA
ACAGGTTTAAAATCACCTCAATAGGCAACTGCCCTTCTGGTTTCTTCTTTGACTAAACAAT
CTGAATGCTTAAGATTTTCCACTTTGGGTGCTAGCAGTACACAGTGTTACACTCTGTATTCC
AGACTTCTTAAATTATAGAAAAAGGAATGTACACTTTTTGTATTCTTTCTGAGCAGGGCCG
GGAGGCAACATCATCTACCATGGTAGGGACTTGTATGCATGGACTACTTTA

14351.1

ACTCTGTGCGCCAGGCTGGAGCCCBTGGMGCGATCTCGACTCCCTGCAAGCTMCGCCTC
ACAGGWTGATGCCATTCTCCTGCCTCAGCATCTGGAGTAGCTGGGACTACAGGCGCCAGC
CACCATGCCAGCTAATTTTT

14351.2

ACCTTAAAGACATAGGAGAATTTAACTGGGAGAGAAAACCTTACAAAATGTAAGGTTTCTG
ACAAGACTTGGGAGTGATTACACCTGGAAACAACATACTGGACTTCACACTGGABAGAAA
CCTTACAAGTGTAATGACTGTGCCAAGCCCTTTGGCAAGCAGTCAACACTTATTCACCATC
AGGCAATTCA

14354.2

AGTCAGGATCATGATGGCTCAGTTTCCCACAGCGATGAATGGACGGCCAAATATGTGGGC
TATTACATCTGAAGAACCTACTAAGCATGATAAACAGTTTGATAACCTCAAACCTTCAGGA
GGTTACATAACAGGTGATCAAGCCCGTACTTTTCTACAGTCAGGTCTGCCGCCCCCGG
TTTTAGCTGAAATATGGGCTTATCAGATCTGAACAAGGATGGGAAGATGGACCAGCAAG
AGTTCTCTATAGCTATGAAACTCATCAAGTTAAAGTTGCAGGGCCAAACAGCTGCCTGTAGT
CCTCCCTCCTATCATGAACAACCCCTATGTTCTCTCCACTAATCTCTGCTCGTTTTGGGA
TGGGAAGCATGCCCAATCTGTCCATTCAAGCCATTGCCCTCCAGTTGCACCTATAGCAAC
ACCCTTGCTCTCTGCTACTTCAGGGACCAGTATTCCTCCCTAATGATGCCTGCT

14354.1

CTTTCGATTTCTTCAATTTGTACGTTTGATTTATGAAGTTGTTCAAGGGCTAACTGCTG
TGTATTATAGCTTTCTCTGAGTTCTTCAGCTGATTTGTTAAATGAATCCATTTCTGAGAGCT
TAGATGCAGTTTCTTTTCAAGAGCATCTAAATGTTCTTTAAGTCTTTGGCATAATTCTTCC
TTTTCTGATGACTTTCTATGAAGTAAACTGATCCCTGAATCAGGTGTGTTACTGAGCTGCAT
GTTTTTAAATTTCTTTGTTTAAATAGCTGCTTCTCAGGGACCAGATAGATAAGCTTATTTGAT
ATTCCTTAAGCTCTTGGTGAAGTTGTTCGATTTCCATAATTTCCAGGTACACTGGTTATCC
CAAACCTTCT

FIG. 1P

16431.1.2

GTGGAGGTGAAACGGAGGCAAGAAAGGGGGCTACCTCAGGAGCGAGGGACAAAGGGGGC
GTGAGGCACCTAGGCCCGCGGCACCCCGGCGACAGGAAGCCGTCTGAACCGGGCTACCGG
GTAGGGGAAGGGCCCCGCGTAGTCCTCGCAGGGCCCCAGAGCTGGAGTCGGCTCCACAGCC
CCGGGCCGTGCGCTTCTCACTTCCTGGACCTCCCCGGCGCCCGGGCCTGAGGACTGGCTCG
GCGGAGGGAGAAGAGGAAACAGACTTGAGCAGCTCCCCGTTGTCTCGCAACTCCACTGCC
GAGGAACTCTCATTTCTTCCCTCGCTCCTTACCCCCCACCTCATGTAGAAAGGTGCTGAA
GCGTCCGGAGGGGAAGAAGAACTGGGCTACCGTCTGGCCTTCCCMCCCCCTTCCCGGGG
CGCTTTGGTGGGCGTGGAGTTGGGGTTGGGGGGTGGGTGGGGTTCTTTTTTGGAGTGT
GGGGAACCTTTTTTCCCTTCTTACAGGTCAGGGGAAAGGGAATGCCAATTCAGAGAGACAT
GGGGGCAAGAAGGACGGGAGTGGAGGAGCTTCTGGAACCTTTCAGCCGTCATCGGGAGG
CGGCAGCTCTAACAGCAGAGAGCGTCAACCGTTGGTATCGAAGCACAAGCGGCATAAGTC
CAAACACTCCAAAGACATGGGGTTGGTGACCCCGAAGCAGCATCCCTGGGCACAGTTAT
CAAACCTTTGGTGGAGTATGATGATATCAGCTCTGATTCCGACACCTTCTCGATGACATG
GCCTTCAAACCTAGACCGAAGGGAGAACGACGAACGTCGTGGATCAGATCGGAGCGACCGC
CTGCACAAACATCGTCACCACCAGCACAGGCGTTCCCGGGACTTACTAAAAGCTAAACAG
ACCG

16432-1

GACATGTTTGCCTGCAGGGGACCAGAGACAATGGGATTAGCCAGTGCTCACTGTTCTTTAT
GCTTCCAGAGAGGATGGGGACAGCTCTCAGGTGAGAATCCAGGCTGAGAAGGCCATGCTG
GTTGGGGGCCCCCGGAAGCACGGTCCGGATCCTCCCTGGCATCAGCGTAGACCCGCTGCTC
AGGCTTGGGGTACCAAACCTCATGCTCTGTACTGTTTTGGCCCCATGCGGTGAGAGGAAAAC
CTAGAAAAAGATTGCTGCTCTAAGGAATCAGCTGCCCCCTCATCCTCCGCATCCAATGCT
GGTGACAACATATTCCTCTCTCCAGGACACAGACTCGGTGACTCCACACTGGGCTGAGTGG
CCTCTGGAGGCTCGTGCCCTAAGCCAGGGCTCCGTAAGGCTGATCGGCTGAAGTGGGTGG
GGTGAGGGTTTCTGACCCTTCCGTTCCCATCCCATAAACCGCTGTCAATGAGCTCACACTGT
GGTCA

16432-2

GATGGCATGGTCGTTGCTAAATGCTCCTCTGGGATGGAGCACTTCCCTCTGTGAGCCCAGG
GGACCCGCTGTCCCTCGAGCTTGGGGCAAGGAGGGAAGAGTGATACCAGGAAGGTGGG
GCTGCAGCCAGGGGCCAGAGTCAGTTCAGGGAGTGCTCCTCGGCCCTCAAAGCTCCTCCG
GGGACTGCTCAGGAGTGATGGTGCCCTGGAGTTTGGCCCAACTTCCCTGGCCACCCTGGAA
GGTGCTTGGCTGCTCCAGGCTCTAGGCTGGGCTGATGGGTTTCTCCAGGACACAAGTATC
ATTAAGCCACCCTCTCCTCAGCTTGTGAGGCGGCACATGTGGGACAGGCTGTGCTCACA
CCCCCTCCCTGCCCCTGCCCTCCATCAGGAGGAGCCAGTGGAACTTCGGAAAGCTCCCAG
CATCTCAGGAGCCCTCAAAGTCTGCTCCTGGCCCAAGCTCTGGTTCTCTGACTGGAGGTCA
TCTGGGCTTGGCCTGCTCTCTCCG

17184.3

TAAAAAAGTGTAACAAGGTTTATTTAGACTTCTTTCATGCCCCAGATCCAGGATGTCTA
TGTAACCGTTATCTTACAAAGAAAGCACAATATTTGGTATAAACTAAGTCAGTGAAGTGC
TTAACTGAAATACCGTCCATCCAAAGTGGGTTAAGGTAAGTAACTACCTGACGATATTGGC
GGGGATCCTGCACTTTGCACTGCTTCCCGGCTTGTCCAGGCTTCCGGGTCTGTTCTTGGC
ACTCATGGGGACAGGCATCCTGCTGCTGTGTGGGGCCCCGCTGGAGCCCTTACGTGAAGCT
GAAGGTATCGACCTAGGGGGCTCTAGGGCAGTGGGACCTTCATCCGGAACCTAACAAGGG
TCGGGGAGAGGCTCTTGGGCTATGTGGC

FIG. 1Q

17184.4

CAAGCGTTCCTTTATGGATGTAAATTCAAACAGTCATGCTGAGCCATCCCGGGCTGACAGT
CACGTTWAAGACACTAGGTCTGGGCGCCACAGTGCCACCCAAAGGAGAAGAAGAAATTTGGA
ATTTTCCATGAAGATGTACGGAAATCTGATGTTGAATATGAAAAATGGCCCCAAATGGAA
TTCCAAAAGGTTACCACAGGGGCTGTAAAGACCTAGTGACCCCTCTAAGTGGGAAAGAGGA
ATGGAGAATAGTATTTCTGATGCATCAAGAACATCAGAATATAAACTGAGATCATAATG
AAGGAAAATTCATATCCAATATGAGTTTACTCAGAGACAGTAGAACTATTCCCAGG

17185.1

TAGGAATAACAAATGTTTATTCAGAAATGGATAAGTAATACATAATCACCCCTTCATCTCTT
AATGCCCCCTTCTCTCTCTCTGACAGGAGACACAGATGGGTAAACATAGAGGCATGGGAA
GTGGAGGAGGACACAGGACTAGCCCACCACCTTCTCTTCCCGGTCTCCCAAGATGACTGCT
TATAGAGTGGAGGAGGCAAAACAGGTCCCTCAATGTACCAGATGGTCACCTATAGCACCA
GCTCCAGATGGCCACGTGGTTGACGCTGGACTCAATGAACTCTGTGACAACCAGAAGAT
ACCTGCTTTGGGATGAGAGGGAGGATAAAGCCATGCAGGGAGGATATTTACCATCCCTAC
CCTAAGCACAGTGCAAGCAGTGAGCCCCCGGCTCCAGTACCTGAAAAACCAAGGCCTAC
TGNCTTTTGGATGCTCTCTTGGGCCACG

17188.2

AAGCCTCCTGCCCTGGAAATCTGGAGCCCTTGGAGCTGAGCTGGACGGGGCAGGGAGGG
GCTGAGAGGCAAGACCGTCTCCCTCCTCTGACCTGCTTCCCCACCAGCCACTGCTGGGC
ACACCAGAAACGCCAGCAGAGAAATGGGAGCGAGAGTCTTAGCCCTGGAGCTGAGG
CTGCCTCTGGGCTGACCCGCTGCTGTACGTGGCCAGAAGTGGCGTTGGCATCTGGCATCC
ATTTGAGCCCAAGGTGGAGGAAAGCGAGCCCAACAGACGAAAACCTATTCCTGCTGTGAC
AACACAGCCCTTGTCCACCCAGCCTAAGTCCAGGAGCGTGAAGTCAGGCAGCCAG
TCGGGGAGGACGAGGTAAGTCAAGCAATGTACCTTGTAGCCTATGGCTCAATGGCC
CGGAGGGCCAGCAACCCCCCGCACAGCTCAGCCAAACAGCAGTGCCTCTGCAGGCACCAAG
AGAGCGATCATGGACTTGAGCCCGTCTTC

17190.1

GTTTGGCAGAAGACATGTTTAAATAACAATTCATATTTAAAAATACAGCAACAATTCTCT
ATCTGTCCACCATCTTGCTTCCCTTCTGCGGCTGAGGCAGACAAAGGAAAGGTAATGA
GGTTAGGGCCCCCAGGCGGGCTAAGTGCTATTGGCTCTCTCTGCTCAAAGAGAGCCATA
GCCAGCTGGGCACGGCCCCCTAGCCCTCCAGTTGCTGAGGCGGCAGCGGTGGTAGAGT
TCTTCACTGAGCCGTGGCTCCAGTCTCCAGGAGAACTTCTGCCACAGCCCTGGCTCTA
CGCCCCGAAAGAGGTGGAGCCCTGAGAACCGGAGGAAAACATCCATCACCTCCAGCCCT
CCAGGGCTTCTCTCTCTCTGCTGCTGCTTCACTTCACTGCCAGCGGGCTCGGGCCGCCAG
GTACTCAGCGTTGTAGAAGCAGCCCTCCGAGAAAGCCTGCCGGTCAAATCTCCCCGCTATA
GGAGCCCCCGGGAGGGGTGAGCAC

FIG. 1R

17190.2

CAAGTTGAACGTCAGGCTTGGCAGAGGTGGAGTGTAGATGAAAACAAAGGTGTGATTATG
AAGAGGATGTGAGTCCTTTGGGTGTAGGAGAGAAAGGCTGTTGAGCTTCTATTTCAAGAT
ACTTTTACCTGTGCAAAAAGCACATTTTCCACCTCCTTCTCATGGCATTGTGTAAGGTGAG
TATGATTCTATTCCATCTGCATTTTAGAGGTGAAGAATAACGTACAAGGGATTCAAGTGAT
TAGCAAGGGACCCCTCACTAAGTGTTGATGGAGTTAGGACAGAGCTCAGCTGTTTGAATCT
CAGAGCCCAGGCAGCTGGAGCTGGGTAGGATCCTGGAGCTGGCACTAATGTGAGGTGCAT
TCCCTCCAACCCAGGCTCAGATCCGGAACCTGACCGTGCTGACCCCCGAAGGGGAGGCAG
GGCTGAGCTGGCCCGTTGGGCTCCCTGCTCCTTTCACACCACACTCTCGCTTTGAGGTGCTG
GGCTGGGACTACTTCACAGAGCAGC

17191.2&89.2

TGGCCTGGGCAGGATTGGGAGAGAGGTAGCTACCCGGATGCAGTCCTTTGGGATGAAGAC
TATAGGGTATGACCCCATCATTTCCCCAGAGGTCTCGGCCTCCTTTGGTGTTCAGCAGCTG
CCCCTGGAGGAGATCTGGCCTCTCTGTGATTTCACTGTGCACACTCCTCTCCTGCCCTC
CAGACAGGCTTGCTGAATGACAACACCTTTGCCAGTGCAAGAAGGGGGTGGTGTGGT
GAACTGTGCCCGTGGAGGGATCGTGGACGAAGGCGCCCTGCTCCGGGCCCTGCAGTCTGG
CCAGTGTGCCGGGGCTGCACTGGACGTGTTTACGGAAGAGCCGCCACGGGACCGGGCCTT
GGTGGACCATGAGAATGTCATCAGCTGTCCCCACCTGGGTGCCAGCACCAAGGAGGCTCA
GAGCCGCTGTGGGGAGGAAATTGCTGTTTCAAGTTCGTGGACATGGTGAAGGGGAAATCTCT
CACGGGGGTTGTGAATGCCCACCCCTT

FIG. 1S

09636801.081007

AGCCAGATGGCTGAGAGCTCCAAGAAGAAGTCAGGATCATGATGGCTCAGTTTCCACAG
CGATGAATGGAGGGCCAAATATGTGGGCTATTACATCTGAAGAACGTACTAAGCATGATA
AACAGTTTGATAACCTCAAACCTTCAGGAGGTTACATAACAGGTGATCAAGCCCGTACTTT
TTTCTACAGTCAGGTCTGCCGGCCCCGGTTTTAGCTGAAATATGGGCCTTATCAGATCTG
AACAAAGGATGGGAAGATGGACCACCAAGAGTTCTCTATAGCTATGAAACTCATCAAGTTA
AAGTTGCAGGGCCAACAGCTGCCCTGTAGTCTCTCCCTCCTATCATGAAACAACCCCTATGT
TCTCTCCACTAATCTCTGCTCGTTTTGGGATGGGAAGCATGCCAATCTGTCCATTATCAG
CCATTGCCCTCCAGTTGCACCTATAGCAACACCCCTGTCTTCTGCTACTTCAGGGACCAGTAT
TCCTCCCCTAATGATGCCTGCTCCCCTAGTGCCTTCTGTAGTACATCCTCATTACCAAATG
GAACTGCCAGTCTCATTACGCCCTTATCCATTCTTATTCTTCTTCAACATTGCCTCATGCA
TCATCTTACAGCCTGATGATGGGAGGATTTGGTGGTGCTAGTATCCAGAAGGCCCAGTCTC
TGATTGATTTAGGATCTAGTAGCTCAACTTCTCAACTGCTTCCCTCTCAGGGAACCTCACCT
AAGACAGGGACCTCAGAGTGGGCAGTTCTCAGCCTTCAAGATTAAAGTATCGGCAAAAA
TTTAATAGTCTAGACAAAGGCAAGAGCGGATACCTCTCAGGTTTTCAAGCTAGAAATGCC
TTCTTCAGTCAAATCTCTCTCAAACCTCAGCTAGCTACTATTGGACTCTGGCTGACATCGAT
GGTGACGGACAGTTGAAAGCTGAAGAAATTTATTCTGGCGATGCACCTCACTGACATGGCC
AAAGCTGGACAGCCACTACCCTGACGTTGCCCTCCCGAGCTTGTCCCTCCATCTTTCAGAG
GGGGAAGCAAGTTGATTCTGTTAATGGAAETCTGCCTTCATATCAGAAAACACAAGAAG
AAGAGCCTCAGAAGAACTGCCAGTTACTTTTGAGGACAAACGGAAAGCCAACTATGAAC
GAGGAAACATGGAGCTGGAGAAGCGACGCCAAGTGTGATGGAGCAGCAGCAGAGGGAG
GCTGAACGCAAGCCCAGAAAGAGAAAGCAAGAGTGGGAGCGGAAACAGAGAGAACTGC
AAGAGCAAGAATGGAAGAAGCAGCTGGAGTTGGAGAAACGCTTGGAGAAACAGAGAGAG
CTGGAGAGACAGCGGGAGGAAGACAGGAGAAAGGAGATAGAAAGACGAGAGGCAGCAA
AACAGGAGCTTGAGACACAACGCCGTTTGAATGGGAAAGACTCCGTCCGCAGGAGCTGC
TCAGTCAGAAGACCAGGGAACAAAGCAACACATTGTCAGGCTGACCTCCAGAAAGAAAAGT
CTCCACCTGGAAGCTGGAAGCAGTGAATGGAAACATCAGCAGATCTCAGGCAGACTACAA
GATGTCCAAATCAGAAAGCAAAACACAAAGACTGAGCTAGAAGTTTTGGATAAACAGTGT
GACCTGGAATTAATGGAATCAAACAACTTCAACAAGAGCTTAAGGAATATCAAAATAAG
CTTATCTATCTGGTCCCTGAGAACAGCTATTAAACGAAAGAAATAAAAACATGCAGCTCA
GTAACACACCTGATTCAGGATCAGTTTACTTCATAAAAAGTCATCAGAAAAGCAAGAAT
TATGCCAAAGACTTAAAGAACAAATGATGCTCTTGAAAAAGAACTGCATCTAAGCTCT
CAGAAATGGATTCAATTAACAAATCAGCTGAACGAACTCAGAGAAAGCTATAATACACAGC
AGTTAGCCCTTGAACAACCTTCATAAAATCAAACGTCACAAATTAAGGAAATCGAAAGAA
AAAGATTAGAGCAAAAAA

FIG. 2A

ATGGCAGTGACATTCACCATCATGGGAACCACCTTCCCTTTTCTTCAGGATTCTCTGTAGTG
GAAGAGAGCACCCAGTGTTGGGCTGAAAACATCTGAAAGTAGGGAGAAGAACCTAAAAAT
AATCAGTATCTCAGAGGGCTCTAAGGTGCCAAGAAGTCTCACTGGACATTTAAGTGCCAA
CAAAGGCATACTTTGGAATCGCCAAGTCAAACTTTCTAACTTCTGTCTCTCTCAGAGAC
AAGTGAGACTCAAGAGTCTACTGCTTTAGTGGCAACTACAGAAAACTGGTGTTACCCAGA
AAAACAGGAGCAATTAGAAATGGTTCCAATATTTCAAAGCTCCGCAAACAGGATGTGCTT
TCCTTTGCCCATTTAGGGTTTCTTCTTTCTTTCTTTCTTTTATTAACCACTA

FIG. 2B

Element Display										= 1" X	
Cell Exp	Probe 1	1 xP	Probe 2	UT 1/2 Element	Plate/Well	Probe 1	S/B	A%	Probe 2	S/B	A%
1.7	304A Ovary T (nuclei)		272A Doublecortin	422A0608 (420)	421G0196 (C.11)	2303	13.7	50	1430	2.0	50
1.1	315A Ovary Tumor		S7 Ovary N	42220626 (420)	421G0196 (C.11)	355	27	54	382	1.0	54
1.0	261A Ovary Tumor		S10 Skeletal muscle N	42230621 (420)	421G0196 (C.11)	1290	6.9	51	707	1.9	51
1.1	264A Ovary Tumor		S2 Pancreas H	422N0629 (420)	421G0196 (C.11)	9580	44.0	62	1100	2.3	62
1.2	306A		S40	42230605 (420)	421G0196 (C.11)	510	3.6	50	610	2.0	50
1.7	265A Ovary Tumor		CT5 Heart N	422O0624 (420)	421G0196 (C.11)	2305	14.0	53	489	2.2	53
1.4	S25 Ovary Tumor		CT4 Bone Marrow N	42210619 (420)	421G0196 (C.11)	531	3.5	53	743	2.0	53
1.9	S22 Ovary Tumor		CT9 Kidney H	42230609 (420)	421G0196 (C.11)	1042	10.0	39	071	2.0	39
1.2	9405 1-P		9405 5-P	42230627 (420)	421G0196 (C.11)	453	3.3	68	857	3.2	68
1.5	202A Ovary Tumor		334A Lung Intestine H	422Y0602 (420)	421G0196 (C.11)	1082	12.2	57	594	2.3	57
1.1	S115		CT10	422A0622 (420)	421G0196 (C.11)	1406	7.5	55	965	2.2	55
1.1	200A Ovary Tumor		CT12 Lung N	422C0604 (420)	421G0196 (C.11)	509	3.4	51	573	2.0	51
2.1	201A Ovary Tumor		S6 Stomach N	422V0625 (420)	421G0196 (C.11)	700	4.5	54	651	2.1	54
1.0	S23 Ovary Tumor		S56 Spinal Cord N	422A0621 (420)	421G0196 (C.11)	626	4.6	46	1335	3.6	46
1.0	205A		270A	422G0620 (420)	421G0196 (C.11)	3096	22.2	50	502	2.2	50
1.0	9334		P2	422Q0606 (420)	421G0196 (C.11)	2251	14.7	46	1256	2.0	46
1.6	305A Ovary T		S01 Fetal tissue	422R0601 (420)	421G0196 (C.11)	552	3.4	72	1028	2.3	72
3.5	263A Ovary Tumor		S73 Breast N	422X0607 (420)	421G0196 (C.11)	8126	35.6	50	1449	2.0	50
3.3	302A		CT18	422K0623 (420)	421G0196 (C.11)	439	3.2	61	1531	3.4	61
1.0	266A		S27	422O0610 (420)	421G0196 (C.11)	387	3.2	50	1270	2.1	50
				42250603 (420)	421G0196 (C.11)	4242	22.2	58	689	2.0	58

FIG. 3

23

TCGAGCGGCCGCCCCGGGCAGGTCCTTCAGACTTGGACTGTGTCACACTGCCAGGCTTCCAG
GGCTCCAACCTTGCAGACGGCCTGTTGTGGGACAGTCTCTGTAATCGCGAAAGCAACCATG
GAAGACCTGGGGGAAAACACCATGGTTTTATCCACCTGAGATCTTTGAACAACCTTCATCT
CTCAGCGTGCGGAGGGAGGCTCTGGACTGGATATTTCTACCTCGGECGCGACCACGCT

FIG. 4

TAGCGYGGTCGCGGCCGAGGYCTGCTTYTCTGTCCAGCCCAGGGCCTGTGGGGTCAGGGC
GGTGGGTGCAGATGGCATCCACTCCGGTGGCTTCCCCATCTTTCTCTGGCCTGAGCAAGGT
CAGCCTGCAGCCAGAGTACAGAGGGCCAACACTGGTGTCTTGAACAAGGGCCTTAGCAG
GCCCTGAAGGRCCCTCTCTGTAGTGTGAACTTCTGGAGCCAGGCCACATGTTCTCCTCAT
ACCGCAGGYTAGYGATGGTGAAGTTGAGGGTGAAATAGTATTMANGRAGATGGCTGGCA
RACCTGCCCCGGGCGGCCGCTCSAAATCC

FIG. 5

AGCGTGGTCGCGGCCGAGGTGTCCTTCAGGGTCTGCTTATGCCCTTGTTCAAGAACACCAG
TGTCAGCTCTCTGTACTCTGGTTGCAGACTGACCTTGCTCAGGCCTGAGAAGGATGGGGCA
GCCACCAGAGTGGATGCTGTCTGCACCCATCGTCCTGACCCCAAAAGCCCTGGACTGGACA
GAGAGCGGCTGTACTGGAAGCTGAGCCAGCTGACCCACGGCATCACTGAGCTGGGCCCCCT
ACACCCTGGACAGGGACAGTCTCTATGTCAATGGTTTCACCCATCGGAGCTCTGTACCCAC
CACCAGCACCGGGGTGGTCAGCGAGGAGCCATTCAACCTGCCCCGGGCGGCCGCTCGA

000T80" T089E960

FIG. 6

A

TTGGGGNTTTMGAGCGGCCGCCCGGGCAGGTACCGGGGTGGTCAGCGAGGAGCCATTAC
ACTGAACTTCACCATCAACAACCTGCGGTATGAGGAGAACATGCAGCACCCCTGGCTCCAG
GAAGTTCAACACCACGGAGAGGGTCTTCAGGGCCTGCTCAGGTCCCTGTTCAAGAGCAC
CAGTGTGGCCCTCTGTACTCTGGCTGCAGACTGACTTTGCTCAGACTTGAGAAACATGGG
GCAGCCACTGGAGTGGACGCCATCTGCACCCTCCGCCTTGATCCCACTGGTCCTGGACTGG
ACAGAGAGCGGCTATACTGGGAGCTGAGCCAGTCCTCTGGCGGNGACNCCNCTT

B

AGCGTGGTCGCGGCCGAGGTCCAGTCCGAGCATGCTCTTTCTCCTGCCCACTGGCACAGTG
AGGAAGATCTCTGCTGTCAGTGAGAAGGCTGTCATCCACTGAGATGGCAGTCAAAAGTGC
ATTTAATACACCTAACGTATCGAACATCATAGCTTGGCCCAGGTTATCTCATATGTGCTCA
GAACACTTACAATAGCCTGCAGACCTGCCCGGGCGGCCGCTCGA

FIG. 7A and 7B

TGTGGTGTTGAACTTCCTGGAGNCAGGGTGACCCATGTCCTCCCCATACTGCAGGTTGGTG
ATGGTGAAGTTGAGGGTGAATGGTACCAGGAGAGGGCCAGCAGCCATAATTGTSGRGCKG
SMGMSSGAGGMWGGWGTYYCWGAGGTTCYRARRTCCACTGTGGAGGTCCCAGGAGTGCT
GGTGGTGGGCACAGAGSTCYGATGGGTGAAACCAATTGACATAGAGACTGTTCTGTCCAG
GGTGTAGGGGCCCAGCTCTTYRATGYCATTGGYCAGTTKGCTYAGCTCCCAGTACAGCCRC
TCTCKGYYGMGWCCAGSGCTTTTGGGGTCAAGATGATGGATGCAGATGGCATCCACTCCA
GTGGCTGCTCCATCCTTCTCGGACCTGAGAGAGGTGAGTCTGCAGCCAGAGTACAGAGGG
CCAACACTGGTGTTCTTTGAATA

FIG. 8

TCGAGCGGCCCGCCCGGGCAGGTCAGGAAGCACATTGGTCTTAGAGCCACTGCCTCCTGGA
TTCCACCTGTGCTGCGGACATCTCCAGGGAGTGCAGAAGGGAAGCAGGTCAAACCTGCTCA
GATCAGTCAGACTGGCTGTTCTCAGTTCTCACCTGAGCAAGGTCAGTCTGCAGCCAGAGTA
CAGAGGGCCAACACTGGTGTTCTTGAACAAGGGCTTGAGCAGACCCTGCAGAACCCTCTTC
CGTGGTGTTGAACTTCCTGGAAACCAGGGTGTTCATGTTTTCTCATAATGCAAGGTTG
GTGATGG

FIG. 9

Gene Name	Bal Probe 1		Probe 2		GEM ID	Probe 1		Probe 2		Probe 1	Probe 2
	Exp Name	P1	P2 Name	P2		Value	%	Value	%	S/B	%
42100188 (03)	17.0 205A Ovary T		270A Liver N		42200606	8620	65	1210	57.7	2.2	65
42100188 (03)	15.9 524 Ovary Tumor		856 Spinal Cord N		42200628	5894	89	1002	35.3	3.9	89
42100188 (03)	15.7 485A Ovary T		591 Fetal tissue		422X0607	12151	71	2121	54.3	2.8	71
42100188 (03)	15.1 476A Ovary T (met)		415A Aorta N		422X0611	7487	73	1480	53.0	9.7	73
42100188 (03)	13.5 761A Ovary Tumor		574 Throat T		42210623	7302	84	2116	39.2	4.5	84
42100188 (03)	13.1 81A Ovary T (met)		11 Colon N		42210649	3714	83	1113	20.4	2.6	83
42100188 (03)	13.0 9134 Ovary T (met)		12 Skin N		422R0601	2435	75	814	12.1	2.1	75
42100188 (03)	12.6 81A Ovary T (met)		272A Dendritic cells		42210608	4578	69	1754	25.0	2.3	69
42100188 (03)	12.2 761A Ovary Tumor		522 Pancreas N		422R0609	7904	81	3596	18.5	5.6	81
42100188 (03)	12.0 866A Ovary T		510 PHMC (liver)		42200605	2191	90	1081	14.0	2.9	90
42100188 (03)	12.0 5115 Ovary T (met)		CT10 Small intestine		42200604	1979	80	974	10.4	2.7	80
42100188 (03)	12.0 765A Ovary Tumor		CT5 Heart T		42200624	1911	93	964	13.9	3.4	93
42100188 (03)	12.0 45A Ovary Tumor		57 Ovary T		42200626	1666	100	817	9.8	4.0	100
42100188 (03)	11.9 498A Ovary T (met)		215A Esophagus N		42210612	1827	97	3480	13.4	9.5	97
42100188 (03)	11.6 761A Ovary Tumor		510 Skeletal muscle		42200624	5914	86	3653	30.4	6.0	86
42100188 (03)	11.6 766A Ovary T		572 Ovary T		42200603	3039	50	1274	11.9	2.6	50
42100188 (03)	11.6 572 Ovary Tumor		CT9 Kidney T		42200627	1716	92	1072	11.0	4.0	92
42100188 (03)	11.4 9085 11 Ovary T (S)		9085 5 P Ovary T (S)		422Y0602	4204	93	3074	23.0	7.7	93
42100188 (03)	11.4 762A Ovary Tumor		315A Large Intestine		422X0622	3002	89	2101	16.6	4.0	89
42100188 (03)	11.3 525 Ovary Tumor		CT1 Bone Marrow		42210619	1643	90	1297	9.6	3.1	90
42100188 (03)	11.2 429A Ovary T (met)		361A Ovary N		42200614	2524	65	2084	22.0	21.9	65
42100188 (03)	11.2 382A Ovary T		CT19 Brain N		42200610	2072	88	1663	10.9	2.3	88
42100188 (03)	11.2 288A Ovary Tumor		CT12 Lung N		422Y0625	1840	87	1473	10.7	3.8	87
42100188 (03)	11.1 201A Ovary Tumor		S6 Stomach N		422W0620	1329	90	1204	9.1	3.5	90

FIG. 10

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Gene Name	Bal Probe 1		P1	Probe 2		GEM ID	Probe1		Probe2	
	Exp Name			P2 Name			S/B	A%	S/B	A%
-21H0181 (C1)	118.8 185A Ovary T			S91 Fetal tissue	-122X0607	26711	103.3	54	1024	2.0
-21H0181 (C1)	111.5 S21 Ovary Tumor			S56 Spinal Cord N	-122X0628	13559	65.3	68	1179	3.9
-21H0181 (C1)	111.1 126A Ovary T (unc)			115A Aorta F	-122X0611	14125	67.3	61	1274	5.6
-21H0181 (C1)	100.8 205A Ovary T			270A Liver N	-122X0606	16121	93.1	43	1488	2.3
-21H0181 (C1)	15.1 261A Ovary Tumor			S74 Breast N	-122H0623	11326	58.2	68	2235	4.4
-21H0181 (C1)	14.6 184A Ovary T (unc)			272A Pancreatic cells	-122X0608	6583	24.5	40	1424	2.1
-21H0181 (C1)	14.4 261A Ovary Tumor			S2 Pancreas F	-122H0629	9865	40.9	64	2245	3.6
-21H0181 (C1)	14.4 199A Ovary T (unc)			161A Ovary N	-122H0614	2803	22.6	60	618	7.4
-21H0181 (C1)	14.2 261A Ovary Tumor			S10 Skeletal muscle	-122X0624	8271	39.5	68	1949	3.6
-21H0181 (C1)	13.8 511S Ovary T (unc)			C110 Small intestine	-122X0603	2281	11.6	60	607	2.1
-21H0181 (C1)	12.5 265A Ovary Tumor			C15 Heart F	-122X0624	4192	19.2	68	1293	4.0
-21H0181 (C1)	12.3 522 Ovary Tumor			C19 Kidney F	-122X0627	565	1.6	70	1276	1.9
-21H0181 (C1)	12.2 266A Ovary T			S22 Ovary N	-122X0603	2774	14.4	46	1260	2.7
-21H0181 (C1)	12.1 9114 Ovary T (SC11)			12 Skin F	-122H0601	1774	8.4	56	837	2.1
-21H0181 (C1)	11.9 948S 1 P Ovary T (S)			948S 1 P Ovary T (S)	-122X0602	6967	41.5	70	3726	9.2
-21H0181 (C1)	11.6 182A Ovary T			C119 Brain N	-122X0610	2311	6.2	50	1471	1.9
-21H0181 (C1)	11.6 288A Ovary Tumor			C112 Lung N	-122X0625	1657	9.7	69	1054	2.9
-1.5 S25 Ovary Tumor	11.4 262A Ovary Tumor			C11 Bone Marrow	-122H0619	848	4.5	65	1243	2.7
-21H0181 (C1)	11.2 186A Ovary T			33A Large intestine	-122X0622	3171	16.8	69	2214	3.8
-1.2 135A Ovary Tumor	11.2 135A Ovary Tumor			S40 PHN1' Activat	-122H0605	630	4.2	53	544	1.9
1.0 201A Ovary Tumor	1.0 201A Ovary Tumor			S7 Ovary N	-122X0626	592	3.7	75	740	2.6
-21H0181 (C1)	1.0 438A Ovary T (unc)			S6 Stomach N	-122X0620	1197	7.8	65	1237	3.5
-21H0181 (C1)	181A Ovary T (unc)			241A Esophagus N	-122X0612	783	4.5	95	797	2.4
				11 Colon F	-122H0609	3470	8.9	24	862	1.7

FIG. 11

Gene Name	Bal Probe 1		Probe 2		GEM		Probe1		Probe2	
	Exp Name	P1	P2 Name	ID	Value	Value	S/B	A%	S/B	A%
42100182 (07)	116.7 426A Ovary T (met)	116.7 426A Ovary T (met)	415A Aorta N	422X00611	7706	462	46.3	75	4.5	75
42100182 (07)	110.7 205A Ovary T	110.7 205A Ovary T	270A Liver N	422Q00606	10171	950	61.2	541	1.8	41
42100182 (07)	19.9 385A Ovary T	19.9 385A Ovary T	S91 Fetal tissue	422X00607	14415	1459	62.1	48	2.2	48
42100182 (07)	18.8 S31 Ovary Tumor	18.8 S31 Ovary Tumor	S36 Splinal Cord N	422C00628	7781	880	47.3	73	3.4	73
42100182 (07)	16.4 383A Ovary T (met)	16.4 383A Ovary T (met)	11 Colon N	422H00609	4807	748	27.6	47	2.2	47
42100182 (07)	15.1 263A Ovary Tumor	15.1 263A Ovary Tumor	S71 Breast N	422H00623	9815	1909	57.1	74	0.2	74
42100182 (07)	14.9 429A Ovary T (met)	14.9 429A Ovary T (met)	361A Ovary N	422H00614	2661	543	20.3	61	6.7	61
42100182 (07)	13.5 261A Ovary Tumor	13.5 261A Ovary Tumor	S72 Pancreas N	422H00629	7934	2274	38.8	71	3.9	71
42100182 (07)	9.9 S35 Ovary Tumor	9.9 S35 Ovary Tumor	C11 Bone Marrow	422H00619	480	1375	3.5	80	3.0	80
42100182 (07)	12.8 261A Ovary Tumor	12.8 261A Ovary Tumor	S10 Skeletal muscle	422H00624	8993	3245	34.6	69	5.1	69
42100182 (07)	12.5 3415 Ovary T (met)	12.5 3415 Ovary T (met)	C110 Small intestine	422C00601	1864	748	8.1	67	2.2	67
42100182 (07)	12.3 9331 Ovary T (SCCH)	12.3 9331 Ovary T (SCCH)	P346 F1	422R00601	2552	1113	12.7	41	2.6	41
42100182 (07)	2.3 522 Ovary Tumor	2.3 522 Ovary Tumor	C19 Embryo F1	422R00627	386	889	3.2	69	3.4	69
42100182 (07)	12.2 381A Ovary T (met)	12.2 381A Ovary T (met)	97A Endothelial cell	422H00608	3316	1567	18.7	55	2.2	55
42100182 (07)	2.2 365A Ovary T	2.2 365A Ovary T	C119 Brain F1	422C00610	608	1350	4.2	60	2.3	60
42100182 (07)	11.9 265A Ovary Tumor	11.9 265A Ovary Tumor	C15 Heart F1	422C00624	2964	1080	13.6	67	3.5	67
42100182 (07)	11.8 266A Ovary T	11.8 266A Ovary T	S77 Ovary N	422C00603	1550	847	7.0	58	2.1	58
42100182 (07)	11.5 262A Ovary Tumor	11.5 262A Ovary Tumor	144A Large Intestine	422A00622	2589	1651	13.2	71	3.2	71
42100182 (07)	1.4 386A Ovary T	1.4 386A Ovary T	S10 PHMC lactated	422H00605	534	748	3.9	62	2.2	62
42100182 (07)	1.3 288A Ovary Tumor	1.3 288A Ovary Tumor	C112 Lung N	422N00625	893	1120	5.3	66	3.1	66
42100182 (07)	1.3 335A Ovary Tumor	1.3 335A Ovary Tumor	S7 Ovary N	422C00626	440	567	3.3	60	2.2	60
42100182 (07)	11.2 9485 1 P Ovary T (S)	11.2 9485 1 P Ovary T (S)	9185 5 P Ovary T (S)	422N00602	4188	3529	21.6	66	9.5	66
42100182 (07)	11.1 428A Ovary T (met)	11.1 428A Ovary T (met)	213A Esophagus N	422A00612	725	689	6.2	65	2.8	65
42100182 (07)	11.0 201A Ovary Tumor	11.0 201A Ovary Tumor	S6 Stomach F1	422W00620	1008	1018	7.4	62	3.2	62

FIG. 12

Gene Name	Bal Probe 1		Probe 2		GEM ID	Probe1		Probe2	
	Exp Name	P1	P2 Name	P2		Value	S/B	Value	S/B
421V00189 (D1)	11.2 426A Ovary T (met)		415A Aorta N		422X0611	8072	55.2	243	2.4
421V00189 (D1)	11.7 523A Ovary Tumor		556 Spinal Cord N		42240628	7367	42.6	537	2.5
421V00189 (D1)	12.6 429A Ovary T (met)		464A Ovary N		42240614	2850	21.7	227	3.5
421V00189 (D1)	18.0 485A Ovary T		S91 Fetal tissue		422X0607	11711	51.0	1469	2.2
421V00189 (D1)	17.3 265A Ovary Tumor		S73 Breast N		42210623	6949	37.8	952	2.6
421V00189 (D1)	5.8 525 Ovary Tumor		C14 Bone Marrow		42210619	208	2.1	1210	2.9
421V00189 (D1)	15.0 405A Ovary T		270A Liver H		42200606	8676	52.3	1737	2.6
421V00189 (D1)	14.5 483A Ovary T (met)		11 Colon H		42210609	3149	17.4	707	2.0
421V00189 (D1)	14.4 261A Ovary Tumor		S10 Skeletal muscle		42240621	6312	29.3	1413	2.9
421V00189 (D1)	14.2 261A Ovary Tumor		S2 P. mucosa H		42280609	7612	38.1	1809	3.3
421V00189 (D1)	3.2 482A Ovary T		C19 Brain H		42200610	408	3.4	1508	2.3
421V00189 (D1)	19.9 9311 Ovary T (SCH)		P1 Skin H		42240601	2500	12.3	860	2.1
421V00189 (D1)	12.5 5115 Ovary T (met)		C110 Small intestine		42240601	1424	6.7	569	2.1
421V00189 (D1)	1.4 265A Ovary Tumor		C15 Heart H		42200604	1742	11.8	723	2.8
421V00189 (D1)	12.3 481A Ovary T (met)		272A Endothelial cells		42240608	1083	17.0	1342	2.0
421V00189 (D1)	11.9 266A Ovary T		S22 Ovary H		42250603	1370	8.0	742	2.0
421V00189 (D1)	19.4 486A Ovary T		S40 PHN1 Cerebral		42240605	307	2.6	580	2.0
421V00189 (D1)	11.7 262A Ovary Tumor		34A Large Intestine		42240612	2097	11.2	1202	2.7
421V00189 (D1)	1.3 455A Ovary Tumor		S7 Ovary H		42220626	373	2.9	470	2.0
421V00189 (D1)	11.1 288A Ovary Tumor		C112 Lung H		422X0625	969	5.6	1094	2.9
421V00189 (D1)	11.1 201A Ovary Tumor		S6 Stomach H		422X0630	750	5.6	672	2.4
421V00189 (D1)	11.1 428A Ovary T (met)		243A Esophagus H		42240612	498	4.2	446	2.1
421V00189 (D1)	1.0 9485 LP Ovary T (G)		9485 S P Ovary T (G)		422X0602	3117	16.7	3174	8.2
421V00189 (D1)	S22 Ovary Tumor		C19 Kidney N		42290627	224	2.3	409	2.3

FIG. 13

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Gene Name	Bal Probe Name	P1	P2 Name	Probe 3	GEM ID	Probe1 Value	Probe2 Value	Probe1 S/B	Probe1 A%	Probe2 S/B	Probe2 A%
421100187 (E11)	120.2 426A Ovary T (met)			415A Aorta N	422X0611	5441	270	36.3	50	2.3	50
421100187 (E11)	110.0 S21 Ovary Tumor			556 Sigmoid Col N	422C0628	5118	533	27.1	56	2.3	56
421100187 (E11)	105.3 499A Ovary T (met)			361A Ovary F1	42210614	1252	150	10.1	58	2.5	58
421100187 (E11)	105.7 855A Ovary T			591 Fetal tissue	422X0607	9507	1668	35.8	45	2.1	45
421100187 (E11)	104.4 705A Ovary T			270A Liver N	422C0606	5456	1245	31.4	50	2.0	50
421100187 (E11)	104.2 765A Ovary Tumor			CT5 Head F1	422C0624	1844	438	11.9	48	2.0	48
421100187 (E11)	104.1 829A Ovary T			CT19 Head N	422C0610	309	1259	2.6	48	2.0	48
421100187 (E11)	106 761A Ovary Tumor			510 Skeletal muscle	422C0621	3733	1036	17.7	55	2.3	55
421100187 (E11)	104 764A Ovary Tumor			57A Heart F1	42210624	4163	1249	23.0	62	3.0	62
421100187 (E11)	105 5115 Ovary T (met)			CT10 Small intestine	422C0601	1565	627	8.8	47	2.1	47
421100187 (E11)	104 764A Ovary Tumor			S2 Pancreas F1	422C0609	3455	1640	14.9	60	2.2	60
421100187 (E11)	104 881A Ovary T (met)			CT1A Endocrine cell	422C0608	2667	1270	13.4	44	1.9	44
421100187 (E11)	104 522 Ovary Tumor			CT19 Kidney F1	422C0627	291	605	2.4	51	2.5	51
421100187 (E11)	107 886A Ovary T			S40 PHM (activated)	422C0605	400	687	3.2	47	2.0	47
421100187 (E11)	106 916A Ovary T (SCH)			CT5 Kid N	422C0601	1622	984	7.9	44	2.2	44
421100187 (E11)	105 762A Ovary Tumor			361A Large Intestine	422C0622	1892	1245	10.1	50	2.6	50
421100187 (E11)	105 288A Ovary Tumor			CT12 Lung F1	422C0625	604	908	4.1	62	2.6	62
421100187 (E11)	104 498A Ovary T (met)			214A Esophagus N	422C0612	246	325	2.7	78	1.9	78
421100187 (E11)	103 335A Ovary Tumor			S7 Ovary N	422C0626	382	501	2.9	58	2.0	58
421100187 (E11)	102 201A Ovary Tumor			S6 Stomach N	422C0620	558	677	4.2	58	2.3	58
421100187 (E11)	100 9185 1 P Ovary T (S)			9485 5 P Ovary T (S)	422C0602	2582	2493	15.1	57	6.3	57
421100187 (E11)	104A Ovary T (met)			CT1 Colon F1	422C0609	2261	562	12.5	38	1.7	38
421100187 (E11)	266A Ovary T			S27 Ovary N	422C0603	1739	965	9.7	36	2.2	36
421100187 (E11)	S25 Ovary Tumor			CT1 Bone Marrow	422C0619	283	845	2.2	44	2.2	44

FIG. 14

11721-1

ACGGTTTCAATGGACACTTTTATTGTTTACTTAATGGATCATCAATTTTGTCTCACTACCTA
CAAATGGAATTTTCATCTTGTTCATGCTGAGTAGTGAAACAGTGACAAAGCTAATCATAA
TAACCTACATCAAAAAGAGAACTAAGCTAACACTGCTCACTTTCTTTTAAACAGGCAAAATA
TAAATATATGCACTCTAXAATGCACAATGGTTTAGTCACTAAAAAATCAAATGGGATCTT
GAAGAATGTATGCAAAATCCAGGGTGCAGTGAAGATGAGCTGAGATGCTGTGCAACTGTTT
AAGGGTTCTGGCACTGCATCTCTGGCCACTAGCTGAATCTTGACATGGAAGGTTTTAGC
TAAFGCCAAAGTGGAGATGCAGAAAATGCTAAGTTGACTTAGGGGCTGTGCACAGGAAGCTA
AAAGGCAGGAAAGTACTAAATAATTGCTGAGAGCATCCACCCAGGAAGGACTTTACCTTC
CAGGAGCTCCAAACTGGCACCACCCAGTGCTCACATGGCTGACTTTATCCTCCGTGTTT
CATTTGGCACAGCAAGTGGCAGTG

11721-2

AAGGCTGGTGGGTTTTTGATCCTGCTGGAGAACCCTCCGCTTTCATGTGGAGGAAGAAGGG
AAGGGAAAAGATGCTTCTGGGAACAAGGTTAAAGCCGAGCCAGCCAAAAATAGAAGCTTTC
CGAGCTTCACTTTCCAAGCTAGGGGATGTCTATGTCAATGATGCTTTTGGCACTGCTCACA
GAGCCACAGCTCCATGGTAGGAGTCAATCTGCCACAGAAGGCTGGTGGGTTTTTGATGA
AGAAGGAGCTGAACTACTTTCGAAACGGCTTGGAGAGCCAGAGCGACCCCTTCTGGCCA
TCCTGGGCGGAGCTAAAGTTGCAGACAAGATCCAGCTCATCAATAATATGCTGGACAAAG
TCAATGAGATGATTATTGGTGGTGGAAATGGCTTTTACCTTCCTTAAGGTGCTCAACAACAT
GGAGATTGGCACTTCTCTGTTTGAAGAGGGAGCCAAGATTGTCAAAGACCTAATGTCC
AAAGCTGACAAGAATGGTGTGAAGATTACCTTGCCTGTTGACTTTGTCACTGCTGACAAGT
TTGATGA

11721-1

TTTGTTCCTTACATTTTCTAAAGAGTTACTTAAATCAGTCAACTGGTCTTTGAGACTCTTA
AGTCTGATTTCCAACTTAGCTAATTCATTCTGAGAACTGTGGTATAGGTGGCGTGTCTTTC
TAGCTGGGACAAAAGTTCTTTGTTTCCCTGTAGAGTATCACAGACCTTCTGTGAAGC
TGGACCTCTGTCTGGCCCTTGGACTCCCAATCTGCTTGTATGTTCAAGCCTGGAAATGTT
AATCTTTAATCTTCCATAATGGATGGACATCTGTCTAAGTTGATCCTTTAGAACACTGCAAT
TATCTTCTTTGACTCTAATTTCTTCTTCTTCTTCTTGAATCGCATCACTAAACTTCTCTCCC
ATTCTTAGCTTTCATCTATCACCTGTACAGATCATCTGGAGGGAAGACATGCTCTTAGTA
AAGGCTGCAAGCTGGGTGACAGTACTGTCCAAGTTTCTGAAGTTGCTGAACCTTCTGT
CTTTCTTGTTCAAAGTAACCTGAATCTCTCCAATTGTCTCTTCCAAGTGGACTTTTTCTCTGC
GCAAAGCATCCAG

11721-2

TCATTCCCTGTGATGGCATCTCGAATGTGATGACCAGCCACGAAGTTGTAGATTTCATTCA
ATCAAAGGATTACCATGTGGTGGAAAGCTGTGAGGCAAGAGAAACAAGAACTGTATGGCA
AGTTAAGAAGCACAGAGGCAAAACAAGAGGACACAGAAAAGCAGTTGCAGGAAGCTGAG
CAAGAAATCGAGCAATGAAGAGAAAGATGAGAAAGTTTGTCTAAATCTAAACAGCAGAA
AATCCTAGAGCTGGAAGAAGAGAATGACCCGGCTTAGGGCAGAGGTGCACCTTGCAGGAG
ATACAGCTAAAGAGTGTATGGAACACTTCTTTCTTCCAATGCCAGCATGAAGGAAGAAC
TTGAAAGGGTCAAAATGGAGTATGAAACCCCTTCTAAGAAGTTTCACTCTTTAATGTCTGA
GAAAGACTCTCTAAGTGAAGAGCTTCAAGATTTAAGCATCAGATAGAAGGTAAATGTATC
TAAACAAGCTAACCTAGAGGCCACCGAGAAACATGATAACCAAACGAATGTCACTGAAGA
GGGAACACAGTCTATACCAGGT

FIG. 15A

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11725-32-1.2

AAGCCAATAATCACCATTATTAATATATGCCAACCCTGTACTTGGCAGTTCACAA
ATTCTCACCGTTACAACAACCCCATGAGGTATTTATCCCATTTCTATAGATAGGGAAACCA
CAGCTCAAGTAAGTTAGGAACTGAGCCAAGTATACACAGAATACGAAGTGGCAAAACTA
GAAGGAAAGACTGACACTGCTATCTGCTGGCCTCCAGTGTCTGGCTCTTTTCACACGGGT
CAATGTCTCCAGCGCTGCTGCTGCTGCTGCATTACCATGCCCTCATTGTTTTCTTCCTCTG
GTGTTCAACTGCATCCTTCAAAGAACTAACTCATTCCAGAGACCACTTATTTCTTTCTCTC
TTTCTGAAATTACTTTTAAATAATCTTCATGAGGGGAAAAGAAGATGCCTGTTGGTAGTT
TTGTTGTTTAAAGCTGCTCAATTTGGGACTTAAACAATTTGTTTTTCATCTTGTACATCCTGTA
ACAGCTGTGTTTTGCTAGAAAGATCACTCTCCCTCTCTTTTAGCATGGCTTCTAACCTCTTC
AATTCATTTTCTTTTCTTTCAACACAATCTCAAGTTCTTCAAAGTGTGATGCAGAAGAGGC
CTCTTTCAAGTTATGTTGTGCTACTTCTGAACATGTGCTTTTAAAGATTCATTTTCTTCTTG
AAGATCCTGTAACCACTTCCCTGTATGGCTAGGTCTTTCTCTTTCTTCCAAAACAGCCT
TCATGGTATTATCTGTTCTCTTTTCTTTTAAATAAGTTCAGGAGCTTCAGAAC

11726-1&2

CAAGCTTTTTTTTTTTTTTAAAAAGTGTAGCATTAAATGTTTTATTGTCACGCAGATGGCA
ACTGGGTTTATGTCTTCATATTTTATAATTTTGTAATTAATAAATTACAAGTTTTAAATA
GCCAATGGCTGGTTATATTTTCAGAAAACATGATTAGACTAATTCATTAATGGTGGCTTCA
AGCTTTTCTTATTGGCTCCAGAAAATTCACCCACCTTTTGTCCTTCTTAAAAAACTGGAA
TGTTGGCATGCATTTGACTTCACACTCTGAAGCAACATCCTGACAGTCATCCACATCTACTT
CAAGGAATATCACGTTGGAATACTTTTCAAGAGGGGAATGAAAGAAAGGCTTGATCATTT
TGCAAGGCCCCACACCAGTGGCTGAGAAGTCAACTACTACAAGTTTATCACCTGCAGCGTC
CAAGGCTTCTGAAAAGCAGTCTTGGCTCTCGATCTGCTTCACCATCTTGGCTGCTGGAGTCT
GACGAGCGGCTGTAAAGGACCGATGGAATGGATCCAAAGCACCAAACAGAGCTTCAAGA
CTCGCTGCTTGGCTTGAAATCGGATCCGATATCGCCATGGCCT

11727-1&2

AAGTGTAGCATTAAATGTTTTATTGTCACGCAGATGGCAACTGGCTTTATGTCTTCATATTT
TATATTTTGTAAATTAATAAATTCAGTTTAAATAGCCAATGGCTGGTTATATTTTC
AGAAAACATGATTAGACTAATTCATTAATGGTGGCTTCAAGCTTTTCTTATTGGCTCCAG
AAAAATCACCCACCTTTTGTCCTTCTTAAAAAACTGGAATGTTGGCATGCATTTGACTTCA
CACTCTGAAGCAACATCCTGACAGTCATCCACATCTACTTCAAGGAATATCACGTTGGAAT
ACTTTTCAAGAGGGGAATGAAAGAAAGGCTTGATCATTTTGCAAGGCCCCACACCAGTGG
CTGAGAAGTCAACTACTACAAGTTTATCACCTGCAGCGTCCAAGGCTTCTGAAAAGCAGT
CTTGGCTCTCGATCTGCTTCACCATCTTGGCTGCTGGAGTCTGACGAGCGGCTGTAAGGACC
GATCGAATGGATCCAAAGCACCAACACAGCTTCAAGACTCGCTGCTTGGCATGAATTC
GGATCCGA

FIG. 15B

11723.1.40.19.19

TACAAACTTTTATTGAAACGCACACGCGCACACACACAAACACCCCTGTGGATAGGGAAAA
GCACCTGGCCACAGGGTCCACTGAAACGGGGAGGGGATGGCAGCTTGTAATGTGGCTTTT
GCCACAACCCCTTCTGACAGGGAAGGCCTTAGATTGAGGCCCCACCTCCCATGGTGATGG
GGAGCTCAGAATGGGGTCCAGGGAGAATTTGGTTAGGGGGAGGTGCTAGGGAGGCATGA
GCAGAGGGCACCCTCCGAGTGGGGTCCCGAGGGCTGCAGAGTCTTCAGTACTGTCCCTCAC
AGCAGCTGTCTCAAGGCTGGGTCCCTCAAAGGGGGCTCCAGCGCGGGGCTCCCTGCGC
AAACACTTGGTACCCCTGGCTGCGCAGCGGAAGCCAGCAGGACAGCAGTGGCGCCGATCA
GCACAACAGACGCCCTGGCGGTAGGGACAGCAGGCCCAGCCCTGTGCGTTGTCTCGGCAG
CAGGTCTGGTTATCATGGCAGAAGTGTCTTCCCACACTTCACGTCCTTCACACCCACGTG
AXGGCTACXGGCCAGGAAG

11723.2.40.19.19

CCCGTGGGTGCCATCCACGGAGTTGTTACCTGATCTTTGGAAGCAGGATCGCCCCGTCTGCA
CTGCAGTGGAAGCCCCGTGGGCAGCAGTGATGGCCATCCCCGCATGCCACGGCCTCTGGG
AAGGGGCAGCAACTGGAAGTCCCTGAGACGGTAAAGATGCAGGAGTGGCCGGCAGAGCA
GTGGGCATCAACCTGGCAGGGGCCACCCAGATGCCTGCTCAGTGTGTGGGCCATTTGTCC
AGAAGGGGACGGCAGCAGCTGTAGCTGGCTCCTCCGGGGTCCAGGCAGCAGGCCACAGGG
CAGAACTGACCATCTGGGCACCGCGTTCAGCCACCAGCCCTGCTGTTAAGGCCACCCAGC
TCACCAGGGTCCACATGGTCTGCTTCCCTCCGACTCCGCGGTCTTGGGCCCTGATGGTTC
TACCTGCTGTGAGCTGCCCAGTGGGAAGTATGGCTGCTGCCAATGCCCAACGCCACCTGCT
GCTCCGATCACCTGCACTGCTGCCCAAGACACTGTGTGTGACCTGATCCAGAGTAAGTGC
CTCTCCAAGGAGAACG

11730-1

GAATCACCTTTCTGGTTTAGCTAGTACTTTGTACAGAACAAATGAGGTTTCCCACAGCGGAG
TCTCCCTGGGCTCTGTTTGGCTCTCGGTAAGGCAGGCCTACACCTTTTCTCTCTCTATGG
AGAGGGGAATATGCCATTAAAGGTGAAAAGTCACTTCCAAAAGTGAGAAAGGGATTGATT
GCTGCTTCAGGACTGTGGAAATTTTGAATGTTTTACAAATGGTTGCTACAAAACAAACAA
AAAAGGTAATTACAAAATGTGTACATCACAACATGCTTTTTAAAGACATTATGCATTGTGC
TCACATTCCTTAAATGTTTGTTCCTAAAGGTGCTCAGCCTCTAGCCCAGCTGGATTCTCCGG
GAAGAGGCAGAGACAGTTTCCCCAAAAGACACAGGGAAGGAGGGGGTGGTGAAGGA
GAAAGCAGCCTTCCAGTTAAAGATCAGCCCTCAGTTAAAGGTGAGCTTCCCGCAXGCTGGC
CTCAXGCGGAGTCTGGGTCAGAGGGACGAGCAGCAGCAGGGTGGGACTGGGGCGT

11730-2

AACCGGAGCGCGAGCAGTAGCTGCGTGGCCACCATGGCTGGGATCACCACCATCGAGGCG
GTGAAGCGCAAGATCCAGCTTCTGCAGCAGCAGGCAGATGATGCAGAGGAGCGAGCTGA
GCGCCTCCAGCGAGAAGTTGAGCGAGAAAGCGCGGCGCGGGAACAGGCTGAGGCTGAGG
TGGCCTCCTTGAACCGTAGGATCCAGCTGGTTGAAGAAGAGCTGGACCGTGCTCAGGAGC
GCCTGGCCACTGCCCTGCCAAAAGCTGGAAGAAGCTGAAAAAGCTGCTGATGAGAGTGAGA
GAGGTATGAAGGTTATTGAAAACCGGGCCTTAAAGATGAAGAAAAGATGGAAGTCCAG
GAAATCCAACCTCAAAGAAGCTAAGCACATTCCAGAAGAGGCAGATAGGAAGTATGAAGA
GGTGGCTCGTAAGTTGGTGATCATTCAGGAGACTTGGAAACGCACAGAGGAACGAGCTGA
GCTGGCAGAGTCCCGTGGCGAGAGATGGATGAGCAGATTAGACTGATGGACCAGAACCT
GAAGTGTCTGAGTGC

FIG. 15C

37

11732.1contig

GAGAACTTGGCCTTTATTGTGGGCCCAGGAGGGCACAAGGTGAGGAGGCCAAGGGAGG
GATCTGGTTTTCTGGATAGCCAGGTATAGCATGGGTATCAGTAGGAATCCGCTGTAGCTG
CACAGGCCTCACTTGCTGCAGTTCCGGGGAGAACACCTGCACTGCATGGCGTTGATGACCT
CGTGGTACACGACAGAGCCATTGGTGCAGTGCAAGGGGCACGGCATGGGCTCCGTCTCTCG
AGGGCAGGCAGCAGGAGCATTGCTCCTGCACATCCTCGATGTCAATGGAGTACACAGCTT
TGCTGGCACACTTTCCCTGGCAGTAATGAATGTCCACTTCTCTTGGGACTTACAATCTCCC
ACTTTGATGTAAGTGCACCTTGGCTGTGATGTCTTTGCAATCAGGCTCCTCACATGTGTACA
GCAGGTGCCTGGAAATTTACGATTTTGCCTCCTTCAGCCAGACACTTGTGTTTCAATAATG
GTGGGCAGCCCGTGACCCCTCTTCTCCAGATGTACTCTCTCT

11732.2contig

GCCTGGACCTTGGCGGATCAGTGCCACACAOTGACTTGCTTGGCAAATGGCCAGACCTTGC
TGCAGAGTCATCGTGTCAATTGTGACCATGGACCCCGGCTTCATGTGCCAACAGCCAGTC
TCCTGTTCCGGTGGAGGAGACGTGTGGCTGCCGCTGGACCTGCCCTTGTGTGTGCACGGGC
AGTTCCACTCGGCACATCGTCACTTCGATGGGCAGAAATTTCAAGCTTACTGGTAGCTGCT
CCTATGTCATCTTTCAAAACAAGGAGCAGGACCTGGAAGTGCTCCTCCACAATGGGGCCTG
CAGCCCCGGGGCAAAACAAGCCTGCATGAAGTCCATTGAGATTAAGCATGCTGGCGTCTC
TGCTGAGCTGCACAGTAACATCGAGATGGCAGTGGATGGGAGACTGGTCCTTGGCCCGTA
CGTTGGTGAAAACATGGAAGTCAGCATCTACGGCGCTATCATGTATGAAGTCAGGTTTACC
CATCTTGGCCACATCCTCACATACACCGCCXCAAAACAACGAGTT

11735-1-2

AGATCAACCTCTGCTGCTCAGGAGGAATGCCCTTCTTGTCTTGGATCTTTGCTTTGACGTTT
TCGATAGTRWCACTKKRYTSRAMSKMAAGKGYRATGRWMITKSYWGWWRASYXTMWWW
RSGRARAYTTAGCAYCCCMCCCTWAGCGSAGKACCARGTGCAAGGTGGACTCTTTCTG
GATGTTGTAGTCAGACAGGGTGGGTCATCTTCCAGCTGTTTCCCAGCAAAAGATCAACCTC
TGCTGATCAGGAGGGATGCCCTTCTTATCTTGGATCTTTGCCCTTGACATTCTCGATGGTGT
ACTGGGCTCCACCTCGAGGGTGAAGGTCTTACCAGTCAGGGTCTTCACGAAGATYTGCATC
CCACCTCTGAGACGGAGCAGGAGTGCAGGGTTCGACTCTTCTGGATGTTGTAGTCAGACA
GGGTGCGYCCATCTTCCAGCTCTTCCSAGCAAAAGATCAACCTCTGCTGGTCAAGGAGGRAT
GCCTTCTTGTCTGATCTTTCCYTTGACRTTCTCRATGGTGTCACTCGGCTCCACTTCGA
GAGTGATGGTCTTACCAGTCAGGGTCTTCACGAAGATCTGCATCCCACCTCTAA

11740.2.contig

AAGTCACAAACAGACAAAGATTATACCAGCTGCAAGCTATATTAGAAGCTGAACGAAGA
GACAGAGCTCATGATTCTGAGATGATTGGACACCTTCAAGCTCGAATTACATCTTTACAAG
AGGAGGTGAAGCATCTCAAAACATAATCTCGAAAAAGTGGAAGGAGAAAGAAAAGAGGCT
CAGACATGCTTAATCACTCAGAAAAGGAAAAGAATAATTTAGAGATAGATTTAAACTAC
AACTTAAATCATTACAACAACGGTTAGAACAAGAGGTAAATGAACACAAAGTAACCAAA
CCTCGTTTAACTGACAAACATCAATCTATTGAAGAGGCAAGTCTGTGGCAATGTGTGAG
ATGGAAAAAAGCTGAAGAAGAAAGAGAGCTCGAGAGAAGGCTGAAAATCGGGTTGT
TCAGATTGAGAAACAGTGTTCATGCTAGACGTTGATCTGAAGCAATCTCAGCAGAAACT
AGAACAATTGACTGGAAATAAAGCAAGCATGGACGATGAAGTTAAGAATCTA

FIG. 15D

11765.2&64.2.contig

CGCCTCCACCATGTCCATCAGGGTGACCCAGAAAGTCCTACAAGGTGTCCACCTCTGGCCCC
CGGGCCTTCAGCAGCCGCTCCTACAGAGTGGGCCCCGGTTCCCGCATCAGCTCCTCGAGCT
TCTCCCGAGTGGGCAGCAGCAACTTTCGGCGTGGCCTGGGCGGCGGCTATGGTGGGGCCA
GCGGCATGGGAGGCATACCCGAGTTACGGTCAACCAGAGCCTGCTGAGCCCCCTTGTCT
GGAGGTGGACCCCAACATCCAGGCCGTGCGCACCCAGGAGAAGGAGCAGATCAAGACCTT
CAACAACAAGTTTGCCTCCTTCATAGACAAGGTACGGTTCCTGGAGCAGCAGAACAAAGAT
GCTGGAGACCAAGTGGAGCCTCCTGCAGCAGCAGAAGACGGCTCGAAGCAACATGGACA
ACATGTTTCGAGAGCTACATCAACARCCTTAGGCGGCAGCTGGAGACTCTGGGCCAGGAGA
AGCTGAAGCTGGAGGCGGAGCTTGGCAACATGCAGGGGCTGGTGGAGGACTTCAAGAAC
AAGTATGAGGATGAGATCAATAAGCGTACAGAGATGGAGAACGAATTTGTCTCATCAAG
AAGGATGTGGATGAAGCTTACATGAACAAGGTAGAGCTGGAGTCTCGCCTGGAAGGGCTG
ACCGACGAGATCAACTTCTCAGGCAGCTGTATGAAGAGGAGATCCGGGAGCTGCAGTCC
CAGATCTCGGACACATCTGTGGTCTGTCCATGGACAACAGCCGCTCCCTGGACATGGACA
GCATCATTGCTGAGGTCAAGGCACAGTACGAGGATATTGCCAACCGCAGCCGGGCTGAGG
CTGAGAGCATGTACCAGGTCAAGTATGAGGAGCTGCAGAGCCTGGCTGGGAAGCACGGGG
ATGACCTGCGGCGCACAAAGACTGAGATCTCTGAGATGAACCCGGAACATCAGCCCGGCT
XCAGGCTGAGATTGAGGGCCTCAAAGGCCAGAXGGCTTXCCTGGAXGXCCGCCAT

11767.2.contig

CCCGGAGCCAGCCAACGAGCGGAAAATGGCAGACAATTTTCGCTCCATGATGCGTTATCT
GGGTCTGGAACCCAAACCTCAAGGATGGCCTGGCGCATGGGCGAACCAGCCTGCTGGG
GCAGGGGGCTACCCAGCGGCTTCTATCTCTGGGCGCTACCCCGGGCAGCCACCCCAAGG
GCTTATCTCTGGACAGGCACCTCCAGGGCGCTACCTGGAGCACCTGGAGCTTATCCCGGAG
CACCTGCACCTGGAGTCTACCCAGGGCCACCCAGCGGCCCTGGGGCCTACCATCTTCTGG
ACAGCCAAGTGGCACCGGAGCCTACCTGGCACTGGCCCCCTATGGCGCCCCTGCTGGGGCA
CTGATTGTGCTTATAACCTGCCTTGGCTGGGGAGTGGTGCCTCGCATGCTGATAACAA
TTCTGGGCACGGTGAAGCCCAATCCAAACAGAAATGCTTTAGATTTCCAAAGAGGGAATG
ATGTTGCCCTTCCACTTAAACCCAGCCTTCAATGAGAACAACAGGAGAGTCATTGGTTGCAA
TACAAGCTGGATAA

11768-1&2

GGGAATGCAACAACCTTTATTGAAAGGAAAGTGCAATGAAATTTGTTGAAACCTTAAAAGG
GGAACTTAGACACCCCCCTCRA₂CGMAGKACCARGTGCA₂GTGGACTCTTTCTGGAT
GTTGTAGTCAGACAGGGTRCGWCCATCTTCCAGCTGTTTYCCRGCAAGATCAACCTCTGC
TGATCAGGAGGRATGCCCTTCTTATCTTCGATCTTTGCCCTTGACATTCTCGATGGTGTCACT
GGCCTCCACCTCGAGGGTGATGGTCTTACCAGTCAGGGTCTTCACGAAGATYTGCATCCCA
CCTCTGAGACCGAGCACCAAGGTGCAGGGTRGACTCTTTCTGCATGTTGTAGTCAGACAGG
GTGGGYCCATCTTCCAGCTG₂TTTCCS₂CCAAAGATCAACCTCTGCTGGTCAGGAGGRATGC
CTTCTTGTCTTGGATCTTTGCYTTGACRTTCTCAATGGTGTCACTCGGCTCCACTTCGAGA
GTGATGGTCTTACCAGTCAGGGTCTTCAAGGAAGATCTGCATCCCACCTCTAAGACGGAGCA
C₂FAGGTGCAGGGTGGACTCTTCTGCA₂TG₂TTGTAGTCAGACAGGGTCCGTCCATCTTCCA
GCTGTTTCCCAGCAAAGATCAACCT

FIG. 15E

59

11768-1&2-11735-1&2

AGGTTGATCTTTGCTGGGAAACAGCTGGAAGATGGACGCACCCTGTCTGACTACAAcCATC
CAGAAAGAGTCCACCCTGCACCTGGTGTCTCCGTCTTAGAGGTGGGATGCAGATCTTCGTGA
AGACCCTGACTGGTAAGACCATCACTCTCGAAGTGGAGCCGAGTGACACCATTGAGAAyG
TCAARGCAAAGATCCARGACAAGGAAGGCATYCCTCCTGACCAGCAGAGGTTGATCTTTG
CISGGAAA_gCAGCTGGAAGATGGRCGCACCCTGTCTGACTACAACATCCAGAAAGAGTCYA
CCCTGCACCTGGTGTCTCCGTCTCAGAGGTGGGATGTCARATCTTCGTGAAGACCCTGACTGG
TAAGACCATCACCCCTCGAGGTGGAGCCAGTGACACCATCGAGAATGTCAAGGCAAAGAT
CCAAGATAAGGAAGGCATCCCTCCTGATCAGCAGAGGTTGATCTTTGCTGGGAAACAGCT
GGAAGATGGAGCGCACCCCTGTCTGACTACAACATCCAGAAAGAGTCCACcTYTGCACYTGGT
MCTBCGcCTY₃GAGGKGGGRTG_{caaa}TCTWMGTKW_{aga}CaCtC₃CTKKYAAGRYy₃TCAMCMW₁
gAKKTCgAKYSCASTKWC₃CTWTCRAKAAMGTyrWWGCAW_{aga}TCCMAGACAAGGAAGGC
ATTCTCCTGACCAGCAGAGGTTGATCT

11769.1.contig

ATGGAGTCTCACTCTGTGCGACCAGGCTGGAGCGCTGTGGTGGGATATCGGCTCACTGCAGT
CTCCACTTCCTGGGTTCAAGCGATCCTCCTGCCTCAGCCTCCCGAGTAGCTGGGACTACAG
GCAGGCGTCACCATAATTTTGTATTTTAGTAGAGACATGGTTTCGCCATGTTGGCTGGG
CTGGTCTCGAACTCCTGACCTCAAGTGA₁CTGTCTGGCCTCCCAAGTGTGGGATTACA
GGCGAAAGCCAAACGCTCCCGGCCAGCGAACA₁CTTTAGAATGAAGGAAATATGCAAAAG
AACATCACATCAAGGATCAATTAATTACCATCTAATTAATTACTATATGTGGGTAATTATGA
CTATTTCCCAAGCATTCTACGTTGACTGCTTGAGAAGATGTTTGTCTGCAATGGTGGAGAG
TGGAGAAGGGCCAGGATTCTTAGCT

11769.2.contig

AGCGCGGTCTTCCGGCGCGGACAAAGCTGAAGGTGATGTGGCCGCCCTCAACCGACGCATC
CAGCTCGTTGAGGAGGAGTTGGACAGGGCTCAGGAACGACTGGCCACGGCCCTGCAGAAG
CTGGAGGAGGCAGAAAAAGCTGCAGATGAGAGTGAGAGAGGAATGAAGGTGATAGAAAA
CCGGCCCATCAAGGATGACGAGAGATGGAGATTCAGGAGATGCAGCTCAAAGAGGCCA
AGCACATTGCCGAAGAGGCTGACCGCAATACGAGGAGGTAGCTCGTAACCTGGTCA₁TCC
TGGAGGGTGACCTGGAGACCGCCAGAGGAGCGTGGGAGGTGTCTGAACTAAAATGTGGT
GACCTGGAAGAAGAACTCAAGAATGTTACTAACAATCTGAAATCTCTGGAGGCTGCATCT
GAAAAGTATTCTGAAAAGGAGGACAAATATGAAGAAGAAATTA₁AACTTCTGTCTGACAAA
CTGAAAGAGGCTGAGACCGCTGCTCAATTTGCAGAGAGAAACGGTTGCAAAACTGGAAAAG
ACAATTGATGACCTGGAACAGAAA₁ACTTGGCCAGC

11770.1.contig

GTGCACAGGTCCCATTTATTGTAGAAAAATAATAATTACAGTGATGAATAGCTCTTCTT
AAATTACAAAACAGAAACCACAAAGAGGAAGAGGAAAAACCCAGGACTTCCAAGGGT
GAAGCTGTCCCTCCTCCTGCGACCTCCCAAGGCTCATTAGTGTCCTTGAAGGGGCAGA
GGACTCAGAGGGGATCAGTCTCCAGGGGGCTGGGCTGAAGCGGGTGAGGCAGAGAGTCC
TGAGGGCCACAGAGCTGGGC₁AACTGAGCGGCTCTCTGGCCCCCTCCCCACCACTGCCCA
AACCTGTTTACAGCACCTTGGCCCCCTCCCTCTAAACCGTCCATCCACTCTGCACTTCCCA
GGCAGGTGGGTGGCCAGGCTCAGCCATACTCCTGGGCGGGGTTTCGGTGAGCAAGGC
ACAGTCCCAGAGGTGATATCAAGGCT

FIG. 15F

000180 1039560

11770.2.contig

GCAAGGAACTGGTCTGCTCACACTTGCTGGCTTGGCGATCAGGACTGGCTTTATCTCCTGA
CTCACGGTGCAAAGGTGCACTCTGCGAACGTTAAGTCCGTCCCCAGCGCTTGGAATCCTAC
GGCCCCACAGCCGGATCCCCCTCAGCCTTCCAGGTCTCAACTCCCGTGGACGCTGAACAA
TGGCCTCCATGGGGCTACAGGTAATGGGCATCGCGCTGGCCGTCTGGGCTGGCTGGCCGT
CATGCTGTGCTGCGCGCTGCCCATGTGGCGCGTGACGGCCTTCATCGGCAGCAACATTGTC
ACCTCGCAGACCATCTGGGAGGGCCTATGGATGAACTGCGTGGTGCAGAGCACCGGCCAG
ATGCAGTGCAAGGTGTACGACTCGCTGCTGGCACTGCCGCAGGACCTGCAGGCGGCCCGC
GCCCTCGTCATCATCA

11773.1.contig

TGCAAAAGGGACACAGGGGTTCAAAAATAAAAATTTCTTCCCCCTCCCCAAACCTGTAC
CCCAGCTCCCCGACCACAACCCCCCTTCTCCCCGGGAAAGCAAGAAGGAGCAGGTGTG
GCATCTGCAGCTGGGAAGAGAGAGGCCGGGGAGGTGCCGAGCTCGGTGCTGGTCTCTTTC
CAAAATATAAATACXTGTGTGCAACTGGAAAATCTCCAGCACCCACCACCCAAGCACTCT
CCGTTTTCTGCCGGTGTGAGAGAGGGCGGGGGGAGGGGCGCCAGGCACCGGCTGGCT
GCGGTCTACTGCATCCGCTGGGTGTGACCCCCGCGAGCCTCCTGCTGCTCATTGTAGAAGA
GATGACACTCGGGGTCCCCCGGATGGTGGGGGCTCCCTGGATCAGCTTCCCGGTGTTGGG
GTTACACACCAGCACTCCCCACGCTGCCCGTTACAGACATCTTGCACTGTTTGAGGTTG
TACAGGCCATGCTTGTACAGTTG

11773.1.contig

GGGTTGGAGCGACTGGTTCTTTATTTCAAAAAGACACTTGTCAATATTCAGTATCAAAACA
GTTGCACTATTGATTTCTCTTTCTCCCAATCGGCCCCAAAGAGACCACATAAAAAGGAGAGT
ACATTTTAAGCCAATAAGCTGCGAGGATGTACACCTAACAGACCTCCTAGAAACCTTACCAG
AAAATGGGACTGGGTAGGGAAGCAAACTTAAAAGATCAACAACTGCCAGCCCCACGGA
CTGCAGAGGCTGTACAGCCAGATGGGGTGGCCAGGGTCCACAAACCCAAAGCAAAAGTT
TCAAAATAATATAAAAATTTAAAAAGTTTTGTACATAAGCTATTCAAGATTTCTCCAGCACT
GACTGATACAAAGCACAAATGAGATGGCACTTCTAGAGACAGCAGCTTCAAACCCAGAAA
AGCGTGATGAGATGAGTTTACATGGCTAAATCAGTGGCAAAAACACAGTCTTCTTTCTTT
CTTTCTTTCAAGGAGCGCAGCAAAAGCAAATTAAGTGGTCACCTCAACATAAGCGGGACATGA
TCCATTCTGTAACCAAGTTGTGAAGGGC

11773-2&30-2

CAGGAACCGGAGCCCGACGAGTACCTGGGTGGGCACCATGGCTGGGATCACCACCATCGA
GGCGGTGAAGCGCAAGATCCAGGTTCTGCACCACGAGCAGATGATGCAGAGGAGCGAG
CTGAGCGCCTCCAGCGAGAAGTTGAGGGAGAAAGCGGGGCGCGGAACAGGCTGAGGCT
GAGGTGGCCTCCTTGAACCGTAGGATCCAGCTGGTTGAAGAAGAGCTGGACCGTGCTCAG
GAGCGCCTGGCCACTGCCCTGCCAAAAGCTGGAAGAACCTGAAAAAGCTGCTGATGAGAGT
GAGAGAGGTATGAAGGTTATTGAAAACCGGCCCTTAAAAGATGAAGAAAAGATGGAAGT
CCAGGAAATCCAACCTCAAAGCAAGCTAAGCACATTGCAGAAGAGGAGATAGGAAGTATG
AAGAGGTGGCTCGTAAGTTGGTGATCATTTGAACGAGACTTGAACGCACAGAGGAACGAG
CTGACCTCGCAGACTCCCGTTGCCGAGAGATGGATGAGCAGATTAGACTGATGGACCAGA
ACCTGAAGTGTCTGAGTGC

FIG. 15G

11782.1.contig

ATCTACGTCATCAATCAGGCTGGAGACACCATGTTCAATCGAGCTAAGCTGCTCAATATTG
GCTTTCAAGAGGCCTTGAAGGACTATGATTACAACTGCTTTGTGTTCAGTGATGTGGACCT
CATTCCGATGGACGACCGTAATGCCTACAGGTGTTTTTCGCAGCCACGGCACATTTCTGTT
GCAATGGACAAGTTTCGGGTTTACCTGCCATCAATGGATTCCCTAATAATTATTGGGGTTGGGGAGGA
GAAATGACGACATTTTAAACAGATTAGTTCATAAAGGCATGTCTATATCACGTCCAAATG
CTGTAGTAGGGAGGTGTGCAATGATCCGGCATTCAAGAGACAAGAAAAATGAGCCCAATC
CTCAGAGGTTTGACCGGATCGCACATAAAAGGAAACGATGCGCTTCGATGGTTTGAAC
CACTTACCTACAAGGTGTTGGATGTCAGAGATACCCGTTATATACCCAAATCAC

11782.2.contig

CTAGACCTCTAATTAAGGACACAATCATGCTGGAGAATGAACAGTCTGACCCCGAGGGC
CACAGCGAATTTTAGGGAAGGAGGCAAGAGGTGAGAAGGGAAAGGAAAGGAAGG
AAGGAGAACATAAGAACTGGAGACGTTGGGTGGGTGAGGAGTGTGGTGGAGGCTCGG
AGAGATGGTAAACAAACCTGACTGCTATGAGTTTTCAACCCCATAGTCTAGGGCCATGAG
GGCGTCAGTTCTTGGTGGCTGACGGTCTTCCACCCAGCCCACTGGGGGAGTGGAGTGG
GGAGTTCTGCCAGGTAAGCAGATGTTGTCTCCCAAGTTCCTGACCCAGATGTCTGCCAGGA
TAACGCTGACCTGTTCCCTCAACAAGGGACCTGAAAGTAATTTTGCTCTTAC

11783-1 & 2

CCGAATTCAAGCGTCAACGAATCCCTGCGTTACCATCAAAATCAATTGGCCACCAATGGTACT
GAACCTACGAGTACACCGACTAGCGCGGACTAATCTTCAACTCTCTACATACTTCCCCCAT
TATTCCTAGAACCAGGCGACCTGCGACTCTTGGAGTTGACAATCGAGTAGTACTCCCGAT
TGAAGCCCCCATTCGTATAATAATTACATCACAAGACGTCTTGCACCTCATGAGCTGTCCCC
ACATTAGGCTTAAAAACAGATGCAATTCGCGGACGTCTAAGCCAAACCACTTTACCGCTA
CAGACCGGGGGTATACTACCGTCAATCTCTGAAATCTGTGGAGCAAAACCACAGTTTCAT
GCCCCATCGTCTAGAAATTAATTCGCTAAAAATCTTTGAAATAGGGCCCGTATTTACCCCTA
TAGCACCCCTCTACCCCTCTAG

11786.1.contig

GCTCTTCACACTTTTATTTTAAATCTCTTCACATGGCAGATACAGAGCTGTGCTCTTGAAG
ACCACCACTGACCAGGAAATGGCACTTTTACAAAATCATCCCCCTTTTCATGATTGGAAC
AGTTTTCTGACCGTCTGGGAGCGTTGAAGCGTGACCAGCACATTTGCACATGCAAAAAA
GGAGTGACCCCAAGCGCTCAACCACACTTCCAGAGCTACCATGGGCTGCAGGTGACTT
GCCAGGTTTGGGGTTTCTGAGCTTTCTCTGCTGCGGTGGGGAGGCCCTCAAGAACTGA
GAGGCCGGGGTATGCTTCATGAGTGTAAACATTTACGGGACAAAAGCGCATCATTAGGAT
AAGCAACAGCCACAGCACTTCATGCTTGTGAGGTTAGCTGTAGGAGCGGGTGAAAGGAT
TCAGTTTATGAAAATTTAAACCAAAACAACCGTTTTTACCTGGGTGGGAAACAGGAAAAC
TGTGATGTCGGCCAATGACCACCAATTTCTGCCCATGTGAAGGTCCCCATGAAACC

FIG. 15H

11786.2.contig

CAAGCGCTTGGCGTTTGGACCCAGTTTCAGTGAGGTTCTTGGGTTTTGTGCCTTTGGGGATT
 TGGTTTGACCCAGGGGTACGCTTAGGAAGGTCTTCAGGAGGAGGCCGAGTTCCCTTCAG
 TACCACCCCTCTCTCCCCACTTTCCCTCTCCCGCAACATCTCTGGGAATCAACAGCATATT
 GACACGTTGGAGCCGAGCCTGAACATGCCCTCGGCCCCAGCACATGGAAAACCCCTTC
 CTGCTTAAGGTGTCTGAGTTTCTGGCTCTTGAGGCAATTCAGACTTGAAATTCTCATCAG
 TCCATTGCTCTTGAGTCTTTCAGAGAACTCAGATCAGGTGCACCTGGGAGAAAGACTTT
 GTCCCCACTTACAGATCTATCTCTCCCTTGGGAAGGGCAGGGAATGGGGACGGTGTATGG
 AGGGGAAGGGATCTCTCGGCCCTTCATTGCCACACTTGGTGGGACCATGAACATCTTTAG
 TGTCTGAGCTTCTCAAATTACTGCAATAGGA

13691.1&2

AGCGTCAAAATCAGAATGGAAAAGACTCAAAATCCATCATCAACACCAAGATCAAAAGGAC
 AAGRATCCTTCAAGAAACAGGAAAAAACTCCTAAAACACCAAAAGGACCTAGTTCTGTAG
 AAGACATTAAAGCAAAAATGCAAGCAAGTATAGAAAAAGGTGGTTCTCTCCCAAAGTGG
 AAGCCAAATTCATCAATTATGTGAAGAAATGCTTCCGGATGACTGACCAAGAGGCTATTCA
 AGATCTCTGGCAGTGGAGGAAGTCTCTTAAAGAAAAATAGTTTAAACAAATTTGTTAAAAAAT
 TTCCGTCTTATTTCAATTTCTGTAACAGTTGATATCTGGCTGTCTTTTTATAATGCAGAGT
 GAGAACTTTCCCTACCGTGTTTGATAAATGTTGTCCAGGTTCTATTGCCAAGAATGTGTTGT
 CCAAAATGCCTGTTTAGTTTTAAAGATGCAACTCCACCCTTTGCTTGGTTTTAAGTATGTA
 TGGAAATGTTATGATAGGACATAGTAGTACCGGTGGTCAGACATGGAAATGGTGGGSMGAC
 AAAAAATATACATGTGAAATAA

13692.1&2

TCCGAATCCAAGCGAATTATGGACAAACGATTCCTTTTAGAGGATTACTTTTTCAATTTT
 GGTTTTAGTAATCTAGGCTTTGCCGTGTAAGAATAACAACGATGGATTTTAAATACTGTTTG
 TGGAAATGTGTTTAAAGGATTGATCTACAACCTTTGTATATTTGATAGTATTTCTAACTTTC
 ATTTCTTTACTGTTTGCAGTTAAATGTTCAATGTTCTGCTATGCAATCGTTTATATGCACGTTTC
 TTTAATTTTTTAGATTTTCTGGATGTATAGTTTAAACAACAAAAAGTCTATTTAAAACTG
 TAGCAGTAGTTTACAGTTCTAGCAAAAGACGAAAGTTGTGGGGTTAAACTTTGTATTTTCTT
 TCTTATAGAGGCTTCTAAAAAGGTATTTTTATATGTTCTTTTAAACAAATATTGTGTACAAC
 CTTTAAAAACATCAATGTTTGGATCAAAACAAGACCCAGCTTATTTTCTGC

13693.2

TGTGGTGGCGCGCCCTCAGGTGGAGGCCAGGACTCTGACCCCTGCCCTTCAGCAA
 GGCCCCCGGCAGCGCCGCCACTACGAACCTGCCGTGGGTTGAAAAATATAGGCCAGTAAA
 GCTGAATGAAATTGTGGGAATCAAGACACCGTGAGCACGCTAGAGGTCTTTGCAAGGGA
 AGGAAATGTGCCCCAACATCATCATTCGCGGCCCTCCAGGAACCGGCAAGACCACAAGCAT
 TCTGTGCTTGGCCCCGGCCCTGCTGCCCCCAGCACTCAAAAGATGCCATGTTGGAACCTCAAT
 GCTTCAAATGACAGGGGCATTGACGTTGTGAGGAATAAAATTTAAATGTTTGCTCAACAA
 AAAGTCACTCTTCCCAAAGCCCCGACATAAGATCATCATTTCTGGATGAAGCAGACAGCATG
 ACCGACGGAGCCAGCAAGCCTTGAGGAGAACCATGGAAATCTACTCTAAAACCACTCGT
 TCGCCCTTGCTTGAATGCTTCGGATAAGATCATCGAGCC

13696.1-13744.1

CTTTGCAAAGCTTTTATTTTCATGTCTGCGGCATGGAATCCACCTGCACATGGCATCTTAGCT
GTGAAGGAGAAAAGCAGTGCACGAGAAGGAATGAGTGGGCGGAACCAACGGCCTCCACAA
GCTGCCTTCCAGCAGCCTGCCAAGGCCATGGCAGAGAGAGACTGCAAACAAACACAAGCA
AACAGAGTCTCTTCACAGCTGGAGTCTGAAAGCTCATAGTGGCATGTGTGAATCTGACAA
AATTAAGAGTGTGCATAGTCCATTACATGCATAAAACACTAATAATAATCCTGTTTACACG
TGACTGCAGCAGGCAGGTCCAGCTCCACCCTGCCCTCCTGCCACATCACATCAAGTGCCA
TGGTTTAGAGGGTTTTTCATATGTAATTTCTTTATTCTGTAAAAGGTAACAAAATATACAG
AACAAAACCTTCCCTTTTTAACTAATGTTACAAATCTGTATTATCACTTGGATATAAAT
AGTATATAAGCTGATC

13700.1

CAAGGGATATATGTTGACGGTACRGRGTGA⁵ACTGAACAGATCACAAAGCACGAGAAACA
TTAGTTCTCTCCCTCCCCAGCGTCTCCTTCGTCTCCCTGGTTTTCCGATGTCCACAGAGTGA
GATTGTCCCTAAGTAACTGCATGATCAGAGTGCTGKCTTTATAAGACTCTTCATTACAGCGT
ATCCAATTCAGCAATTGCTTCATCAAATGCCGTTTTTGCCAGGCTACAGGCCTTTTCAGGA
GAGTTTAGAATCTCATAGTAAAAGACTGAGAAATTTAGTGCCAGACCAAGACGAATTGGG
TGTGTAGGCTGCATTNCTTTCTTACTAATTTCAAATGCTTCCTGGTAAGCCTGCTGGGAGTT
CGACACAAGTGGTTTGTGTTGCTCCAGATGCCACTTCAGAAAGATACCTAAAAATAATCT
CCTTTCATTTTCAAAGTAGAAGAC

13700.2

TCCGGAGCCGGGGTAGTCCCGCCGGCCCGCCGGGTGCAGCCACTGCAGGCACCGCTGCC
CCCGCCTCAGTAGTGGGCTTAGGAAGGAAGAGCGTCATCTCGCTCGGAGCTTCGCTCGGAA
GGGTCTTTGTTCCCTGCCAGCCCTCCACGGGAATGACAATGGATAAAAAGTGAGCTGGTACA
GAAAGCCAAACTCGCTGAGCAGGCTGAGCGATATGATGATATGGCTGCAGCCATGAAGGC
AGTCACAGAACAGGGGCA⁵GA⁵ACTCTCCAACGAAGAGAGAAATCTGCTCTCTGTTGCCTA
CAAGAATGTGGTAAGGGCCCGCCGGCTCTTCTGGCGTGTCTCTCCAGCATTGAGCAGA
AAACAGAGAGGAATGAGAACAAGCAGCAGATGGGCAAGAGTACCGTGAGAAAGATAGA
GCCAGAACTGCAGGACATCTCCAATGATGTTCTGCAGCTTGTGGACAAATATCTTATTCC
AATGCTACACAACCCAGAAA

13701.1

AAAAAGCAGCARGTTCAACACAAAATAGAAAATCTCAAATGTAGGATAGAACAAAACCAA
GTGTGTGAGCGCGGAAGCAACAGCAAAAGGAAGAAATGAGATGTTGCAAAAAAGATGGA
GGACGGTTCCCTCTCCTCTCGGGACTGACTCAAAACACTGATGTGGCAGTATACACCATTC
CAGAGTCACGGGTGTTCA⁵TTCTTTTGGGACTAAGAAAAGGTGGGGATTAAAGAAGACGT
TTCTGGAGGCTTAGGGACCAAGGCTGGTCTCTTTCCCCCTCCCAACCCCTTGATCCCTTT
CTCTGATCAGCGGAAAGGACCTCGAATCAGGCGAGGTAGAGTTGGAAAGGGAAAGGATT
CACTTGACAGAATGGGACAGACTCCTTCCCA

FIG. 15J

13701.2

TGGCAATAGCACAGCCATCCAGGAGCTCTTCARGCGCATCTCGGAGCAGTTCACTGCCATG
TCCCGCCGGAAGGCCTTCCTCCACTGGTACACAGGCGAGGGCATGGACGAGATGGAGTTC
ACCGAGGCTGAGAGCAACATGAACGACCTCGTCTCTGAGTATCAAGCAGTACCAGGATGC
CACCGCAGAAGAGGAGGAGGATTTTCGGTGAGGAGGCCGAAGAGGAGGCCTAAGGCAGAG
CCCCATCACCTCAGGCTTCTCAGTTCCCTTAGCCGTCTTACTCAACTGCCCTTTCTCTCC
CTCAGAATTTGTGTTTGCTGCCTCTATCTTGTGTTTTTCTTCTGCGGGGGTCTAGAA
CAGTGCTGGCACATAGTAGGCGCTCAATAAATACTTGGTTGNTGAATGTCTCCT

13702.2

AGCTGGCGCTAGGGCTCGGTTGTGAAATACAGCGTRGTCAGCCCTTGGCGCTCAGTGTAAGAA
ACCCACGCCTGTAAGGTCGGTCTTCGTCCATCTGCTTTTTCTGAAATACACTAAGAGCAG
CCACAAAACTGTAACCTCAAGGAAACCATAAAGCTTGGAGTGCCTTAATTTTAAACCAGTT
TCCAATAAAACGGTTTACTACCT

13704.2-13740.2

GGAGATGAAGATGAGGAAGCTGAGTCAGCTACGGGCGCGGGCAGCTGAAGATGATGA
GGATGACGATGTGATACCAAGAAGCAGAAAGACCGACGAGGATGACTAGACAGCAAAAA
AGGAAAAAGTTAAA

13706.1

GATGAAAATTAATACTTAAATTAATCAAAAGGCACTACGATACCACCTAAAACCTACTG
CCTCAGTGGCAGTAKGCTAAKGAACATCAAGCTACAGSACATYATCTAATAATGAATGTTA
GCAATTACATAKARGAAGCATGTTTCTTTCCAGAAGACTATGGNACAATGGTCAATTWG
GCCCCAAGAGGATATTTGCCCGGAAAGCATCAAGATAGATNAANGTAAAG

13706.2

GAGTAGCAACGCAAAGCGCTTCGTATTGAGTCTGTGGGSGACTTCGGTTCCGGTCTCTGCA
GCAGCCGTGATCGCTTAGTGGAGTGCTTAGCGGTAGTTGGCCAGGATGCCGAATATCAAAA
TCTTCAGCAGGCAGCTCCCACCAGGACTTATCTCASAAAATTGCTGACCGCCTGGGCCTGG
AGCTACGCAAGGTGGTGACTAAGAAATTCAGCAACCAGGAGACCTGTGTGGAAATTGGTG
AAAGTGTAACCGTGGACAGGATGTCTACATTGTTTCAGAGTGGNTGTGGCGAAATCAATGAC
AATTTAATGGAGCTTTTGATCATGATTAATGCCTGCAAGATTGCTTCAGCCAGCCGGGTTA
CTGCAGTCATCCCATGCTTCCCTTATGCCCCGGCAGGATAAGAAAGATNAGAGCCGGGCC
GCCAATCTCAGCCAAGCTTGGTGCAAAATATGCTATCTGTAGCAGTGCAGATCATATTATCA
CATGGACCTACATGCTTCTCAAAATTCANGGCTTTT

FIG. 15K

13707.3

ATGCAAAAGGGGACACAGGGGGTTCAAAAATAAAAAATTTCTTCCCCCTCCCCAAACCT
GTACCCCAGCTCCCCGACCACAACCCCTTCTCCCCCGGGGAAAGCAAGAAGGAGCAGG
TGTGGCATCTGCAGCTGGGAAGAGAGAGGCCGGGGAGGTGCCGAGCTCGGTGCTGGTCTC
TTTCCAAATATAAATACGTGTGTCAGAACTGGAATACTCCAGCACCCACCACCCAAGCA
CTCTCCGTTTTCTGCCGGTGTGGAGAGGGGGCGNGGGCAGGGGCGCCAGGCACCGGCT
GGCTGCGGTCTACTGCATCCGCTGGGTGTGCACCCCGCGA

13710.2

AGGTTGGAGAAGGTTCATGCAGGTGCAGATTGTCCAGGSKCAGCCACAGGGTCAAGCCCCAA
CAGGCCCAGAGTGGCACTGGACAGACCATGCAGGTGATGCAGCAGATCATCTAACACA
GGAGAGATCCAGCAGATCCCGGTGCAGCTGAATGCCGGCCAGCTGCAGTATATCCGCTTA
GCCCAGCCTGTATCAGGCACTCAAGTTGTGCAGGGACAGATCCAGACACTTGCCACCAAT
GCTCAACAGATTACACAGACAGAGGTCCAGCAAGGACAGCAGCAGTTCAAGCCAGTTCAC
AAGATGGACAGCAGCTCTACCAGATCCAGCAAGTCACCATGCCTGCGGGGCCANGACCTCG
CCAGCCCATGTTTCATCCAGTCAAGCCAACCCAGCCCTTCNACGGGCAGGCCCCCAGGTGAC
CGGCGACTGAAGGGCCTGAGCTGGCAAGGCCAANGACACCCAACACAATTTTTGCCATAC
AGCCCCCAGGCAATGGGACAGCCTTTCTCCAGAGGAC

13710-1

TGAGATTTATTGCAATTCATCCAGCTTGAAGTCCATGCAAAGGRCAGTACACAGTTTTTA
ATGCATTTAAAAATAAAAGCGAGGTGGCCAGCAAAACACAAAAGTCCTAGTTTCTGGG
TCCCTGGGAGAAAAGAGTGTGGCAATGAATCCACCCACTCTCCACAGCGAATAAATCTGT
CTCTTAAATGCAAGAATGTTTCCATGGCCTCTGGATGCAATAACACAGAGCTCTGGGGTC
AGAGCAAGGGATGGGAGAGGACCAAGTGAAGCAAGCAGCTACACACATTCACCTAAT
TCCATCTGAGGGCAAGAACAACTGGCAAGTCTTGGGGGTAGCAGCTGTT

13711.1

TCCAGACATGCTCCTGTCTAGCGGGGACCAGGAACCAGACCTGCTATGGGAAGCAGAA
AGAGTTAAGCGAAGGTTTCTTTCATTCCTGTTCTTCTTTTGTCTTTGAACAGTTTTTA
AATATACTAATAGCTAAGTCAATTCGCCAGCCAGGTCCCGGTGAACAGTAGAGAACAAGGA
GCTTGCTAAGAATTAATTTTGTGTTTTTACCCCATTCAAACAGAGCTGCCCTGTTCCTGT
ATGGAGTTCCATTCCTGCCAGGGCACGGCTGAGTAACAGGAAGCCATTCAAGAAAGGCGG
GTGTGAATCACTGCCACCCCATGGACAGACCCCTCACTCTTCTTACCCGCAAGCGCT
ACTTAATAAATAATTTATATCTTTGAAATTAATGATAACCGATTTTCCCATGCGGCATCCTA
AGGGCACTTGCCAGCTCTTATCCGGACAGTCAAGCACTGTTGTTGGACAACAGATAAAGG
AAAAGAAAAAGAAAGAAAACAACCGCAACTTCTGT

FIG. 15L

13711.2

TGAGACGGACCACTGGCCTGGTCCCCCTCATKTGCTGTCGTAGGACCTGACATGAAACGC
AGATCTAGTGGCAGAGAGGAAGATGATGAGGAACCTTCTGAGACGTCGGCAGCTTCAAGAA
GAGCAATTAATGAAGCTTAACTCAGGCCTGGGACAGTTGATCTTGAAAGAAGAGATGGAG
AAAGAGAGCCGGGAAAGGTCATCTCTGTTAGCCAGTCGCTACGATTCTCCCATCAACTCAG
CTTCACATATTCCATCATCTAAAACCTGCATCTCTCCCTGGCTATGGAAGAAATGGGCTTCA
CCGGCCTGTTTCTACCGACTTCGCTCAGTATAACAGCTATGGGGATGTCAGCGGGGGAGTG
CGAGATTACCAGACACTTCCAGATGGCCACATGCCTGCAATGAGAATGGACCGAGGAGTG
TCTATGCCCAACATGTTGGAACCAAGATATTTCCATATGAAATGCTCATGGTGACCAACA
GAGGGCCGAAACCAATCTCAGAGAGGTGGACAGAA

13713.1&2

TCACTTTATTTTCTTGTATAAAAAACCCTATGTTGTAGCCACAGCTGGAGCCTGAGTCCGCT
GCACGGAGACTCTGGTGTGGGTCTTGACGAGGTGGTCAGTGAACCTCTGATAGGGAGACT
TGGTGAATACAGTCTCCTTCCAGAGGTGGGGGGTCAGGTAGCTGTAGGTCTTAGAAATGGC
ATCAAAGGTGGCCTTGGCGAAGTTGCCCAGGTGGCAGTGCAGCCCCGGGCTGAGGTGTA
GCAGTCATCGATACCAGCCATCATGAG

13715.4

CTGGAATATAGACCCGTGATCGACAAAACCTTGAACGAGGCTGACTGTGCCACCGTCCCGC
CAGCCATTGGCTCCTACTGATGAGACAAAGATGTGGTGATGACAGAAATCAGCTTTTGTAAAT
ATGTATAATACCTCATGCATGTGTCCATGTCTAACTGTCTTATACGCTTCTGCACTCTGG
GGAAGAAGGAGTACATTGAAGGGAGATTGCCACCTAGTGGCTGGGAGCTTGGCAGGAACC
CAGTGGCCAGGGAGCGTCCCACTTACCTTTGTCCTTGGCTTCACTTGTGTGAGATGATAAA
ACTGGCCACAGCTCTTAAATAAAATATAAAATGAACA

13717.1&2

TGAATGGGGACGAGCTGACCCAGGAAAATGCAGCTTGNGGAGACCAGGCCTGCAGGGGAT
GGAACCTTCCAGAAAGTGGGCATCTGTGGTGGTGCCCTTTGGGAAGGAGCAGAAAGTACACA
TGCCATGTGGAACATGACGGGGCTGCCCTGAGCCCCCTCACCTGAGATGGGGCAAGGAGGAG
CCTCCTTTCATCCACCAAGACTAACACAGTAATCATTTGCTGTTCCGGTTGTCTTGGAGCTGT
GGTCATCCTTGGAGCTGTGATGGCTTTGTGATGAAGAGGAGGAGAAACACAGGTGGAAA
AGGAGGGGACTATGCTCTGGCTCCAGGCTCCAGAGCTCTGATATGTCTCTCCAGATTGT
AAAGTGTGAAGACAGCTGCCCTGGTGTGGACTTGGTGACAGACAATGTCTTACACATCTCC
TGTGACATCCAGAGACCTCAGTTCTCTTTAGTCAAGTGTCTGATGTTCCCTGTGAGTCTGCG
GGCTCAAGTGAAGAACTGTGGAGCCCCAGTCCACCCCTGCACACCAGGACCCTATCCCTG
CACTGCCCTGTGTTCCCTTCCACAGCCAACTTGGCTGCTCCAGCCAAACATTGGTGGACAT
CTGCAGCCTGTCAGCTCCATGCTACCCCTGACCTTCAACTCCTCACTTCCACACTGAGAATA
ATAATTTGAATGTGGGTGGCTGGACAGATGGCTCAGCGCTGACTGCTCTTCCAAAGGTCT
GAGTTCAAATCCCAGCAACCACATGGTGGCTCACAACCATCTGTAATGGGATCTAATACCC
TCTTCTGCAGTGTCTGAAGACASCTACAGTGTACTTACATATAATAATAAATAAG

FIG. 15M

05633304.081000

13719.1&2

GGCCGGGCGCGCGCGCCCCGCCACACGCACGCCGGGCGTGCCAGTTTATAAAGGGAGAG
AGCAAGCAGCGAGTCTTGAAGCTCTGTTTGGTGCTTTGGATCCATTTCCATCGGTCTTAC
AGCCGCTCGTCAGACTCCAGCAGCCAAGATGGTGAAGCAGATCGAGAGCAAGACTGCTTT
TCAGGAAGCCTTGGACGCTGCAGGTGATAAACTTGTAAGTAGTTGACTTCTCAGCCACGTGG
TGTGGGCTTGGCAAAATGATCAAGCCTTTCTTTTCATTCCTCTCTGAAAAGTATTCCAACGT
GATATTCCTTGAAGTAGATGTGGATGACTGTCAGGATGTTGCTTCAGAGTGTGAAGTCAAA
TGCATGCCAACATTCCAGTTTTTTAAGAAGGGACAAAAGGTGGGTGAATTTTCTGGAGCCA
ATAAGGAAAAGCTTGAAGCCACCATTAAATGAATTAGTCTAATCATGTTTTCTGAAAATATA
ACCAGCCATTGGCTATTTAAACTTGTAATTTTTTTAAATTTACAAAATATAAAATATGAA
GACATAAACCCMGTTGCCATCTGCGTGACAATAAAACATTAATGCTAACACTT

13721.1

TCACATAAGAAATTTAAGCAAGTTACRCTATCTTAAAAAACACAACGAATGCATTTTAATA
GAGAAACCCTTCCCTCCCTCCACCTCCCTCCCCACCCTCCTCATGAATTAAGAATCTAAG
AGAAGAAGTAACCATAAAAACCAAGTTTGTGGAATCCATCATCCAGAGTGCTTACATGGT
GATTAGGTTAATAATGCTTCTTACAAAAATTTCTATTTTAAAAAAATTATAACCTTGATTG
CTTATTACAAAAAAATTCAGTACAAAAGTTCAATATATTGAAAAATGCTTTTCCCTCCCT
CACAGCACCGTTTTATATATAGCAGAGAATAATGAAGAGATTGCTAGTCTAGATGGGGCA
ATCTTCAAATTACACCAAGAGGCACAGTGGTTTATTTACCCTCCCTTCTCATAAG

13721.2

GGAAAGGATTCAAGAAATTAGACGACTTCTTGGCTRRAGAAAAAGACAACCTCTCGTCGCAT
GCTGACAGACAAAGAGAGAGAGATGGCCGAAATAAGGGATCAAATGCAGCAACAGCTGA
ATGACTATGAACAGCTTCTTGAATGTAAGTTAGCCCTGGACATGGAAATCAGTGCTTACAG
GAAACTCTTAGAAGGCCAAGCAAGAGAGGTTGAAGCTGTCTCCAAGCCCTTCTTCCCGTGT
GACAGTATCCCGAGCATCCTCAAGTCTAGTGTACCGTACAACCTAGAGGAAAGCGGAAGA
GGGTTGATGTGGAAGAATCAGAGGCCAAGTAGTAGTGTAGCATCTCTCATTCGGCTCAA
CCACTGGAAATGTTTGCATCGAAGAAATTCATGTTGATGGGAAATTTATCCCGCTTGAAGA
ACACTTCTGAACAGGATCAACCAATGGGAAGCCTTGGGAGATGATCAGAAAAATTGGAGA
CACATCAGTCAGTTATAAATATAACCTCAA

13723.1

CATGGGTTTCACCAGGTTGCCAGGCTGCTCTTGAAGTCTGACCTCAGGTGATCCACCCG
CCTCGGCCTCCCAAAGTCTCTGGGATTACAGGCGTGAGCCACCACGCCCGGCCCAAGC
TGTCTCTTTTGTCTTACCGTAAAGCTCTCTGCCATGCAGTATCTACATAACTGACGTGAC
TGCCAGCAAGCTCAGTCACTCCGTGCTCTTTCTCTTTCCAGTCTCTCTCTCTCTTCAAG
TTCTGCCTCAGTGAAAGCTGCAGGTCCCCAGTTAAGTGATCAGGTGAGGGTTCTTTGAACC
TGGTCTATCAGTCGAAATTAATCCTTCATGATGG

FIG. 15N

13723.2

GATGTGTTGGACCTCTGTGTCAAAAAAACCTCAGAAAGAAATCCCCTGCTCATTACAGAA
GAAGATGCATTTAAATATGGGTTATTTTCAACTTTTTATCTGAGGACAAAGTATCCATTAA
TTATTGTGTCAGAAGAGATTGAATACCTGCTTAAGAAGCTTACAGAAGCTATGGGAGGAG
GTTGGCAGCAAGAACAATTTGAACATTATAAAATCAACTTTGATGACAGTAAAAATGGCC
TTTCTGCATGGGAACCTTATTGAGCTTATTGGAAATGGACAGTTTAGCAAAGGCATGGACCG
GCAGACTGTGTCTATGGCAATTAATGAAGTCTTTAATGAACTTATATTAGATGTGTTAAAG
CAGGGTTACATGATGAAAAAGGGCCACAGACGGAAAACTGGACTGAAAGATGGTTTGTA
CTAAAACCCAACATAATTTCTTACTATGTGAGTGAGGATCTGAAGGATAAGAAAGGAGAC
ATTCTCTTGGATGAAAATTGCTGTGTAGAAGTCTTGCTGACAAAAGATGGAAAGAAAT
GCCTTTT

13725.1

GACTGGTCTTTTATTTCAAAAAGACACTTGTCAATATTCAGTRTCAAAACAGTTGCACTATT
GATTTCTCTTTCTCCCAATCGGCCCCAAAGAGACCACATAAAAGGAGAGTACATTTTAAGC
CAATAAGCTGCAGGATGTACACCTAACAGACCTCCTAGAAACCTTACCAGAAAAATGGGGA
CTGGGTAGGGAAGGAACTTAAAGATCAACAACTGCCAGCCACGGACTGCAGAGGCT
GTCACAGCCAGATGGGGTGGCCAGGGTGGCCACAAACCCAAAGCAAAGTTTCAAAATAATA
TAAAAATTTAAAAAGTTTGTACATAAGCTATTCAAGATTTCTCCAGCACTGACTGATACAA
AGCACAATTGAGATGGCACTTCTAGAGACAGCAGCTTCAAACCCAGAAAAGGGTGATGAG
ATGAAGTTTCACATGGCTAAATCAGTGGCAAAAACACAGTCTTCTTTCTTTCTTTCTTCAA
GGANGCAGGAAAGCAATTAAGTGGTCACCTTAACATAAGGGGGAC

13725.2

TGGGTGGGCACCATGGCTGGGATCACCACCATCGAGCGGTGAAGCGCAAGATCCAGGTT
CTGCAGCAGCAGGCAGATGATGCAGAGGAGCGAGCTGAGCGCCTCCAGCGAGAAGTTGA
GGGAGAAAGCGGGGCCCCGGAACAGGCTGAGGCTGAGGTGGCCTCCTTGAACCGTAGGA
TCCAGCTGGTTGAAGAAGAGCTGGACCGTCTCAGGAGCGCCTGGCCACTGCCCTGCAAA
AGCTGGAAGAAGCTGAAAAAGCTCTGATGACAGTGAGAGAGGTATGAAGGTTATTGAA
AACC GGCGCTTAAAGATGAAGAAAGATGGAAGTCCAGGAAATCCAACCTCAAAGAAGC
TAAGCACATTGCAGAAGAGCGCAGATAGGAAGTATGAAGAGGTGGCTCGTAAGTTGCTGAT
CATTGAAGGAGACTTGGAAACCGCACAGAACGAACGAGCTTGAGCTTGGCAAAAGTCCCGT
TGCCACAGATGGGATGAACCAGATTAGACTGATGGACCANAACC

13726.1&2

AGGGGNCYCGGGTGGCTGGGCGCACTGGGTGACCGACTTAGCCTGGCCAGACTCTCAGCAC
CTGGAACCGCCCCGAGAGTGACAGCGTGAGCGCTGGGAGGGAGGACTTGGCTTGAGCTTGT
TAAACTCTGCTCTGAGCCTCCTTGTGGCTGCATTTAGATGGCTCCCGCAAAAGAGGGTGG
CGAGAAGAAAAAGGGCGGTTCTGCCATCAACGAAGTGGTAACCCGAGAATACACCATCAA
CATTACAAAGCGCATCCATGGAGTGGGCTTCAAGAAGCGTGCACCTCGGGCACTCAAAGA
GATTCCGAAATTTGCCATGAAGGAGATGGGAAGTCCAGATGTCCGCAATTGACACCAGGCT
CAACAAAGCTGTCTGGGCAAAAGCAATAAGGAATGTGCCATACCGAATCCGGTGTCCGGC
TGTCCAGAAAACGTAATGACGATGAAGATTACCAAAATAAGCTATATACTTTGGTTACCTA
TGTACCTGTTACCACTTTCAAAAATCTACAGACAGTCAATGTGGATGAGAACTAATCGCTG
ATCGTCAGATCAAAATAAGTTATAAAT

FIG. 150

13727.1

TCGGGAGCCACACTTGGCCCTCTTCTCTCCAAAGSGCCAGAACCTCCTTCTCTTTGGAGAA
TGGGGAGGCCTCTTGGAGACACAGAGGGTTTCACCTTGGATGACCTCTAGAGAAATTGCC
CAAGAAGCCCACCTTCTGGTCCCAACCTGCAGACCCACAGCAGTCAGTTGGTCAGGCCCT
GCTGTAGAAGGTCACCTTGGCTCCATTGCCTGCTTCCAACCAATGGGCAGGAGAGAAGGCC
TTTATTTCTCGCCACCCATTCTCTCTGTACCAGCACCTCCGTTTTTCAGTCAGTGTTGTCCA
GCAACGGTACCGTTTACACAGTCACCTCAGACACACCATTTTCACCTCCCTTGCCAAGCTGT
TAGCCTTAGAGTGATTGCAGTGAACACTGTTTACACACCGTGAATCCATTCCCATCAGTCC
ATTCCAGTTGGCACCAGCCTGAACCATTTGGTACCTGGTGTTAACTGGAGTCCTGTTTACA
AGGTGGAGTCGGGGCTTGCTGACTTCTCTTCATTGAGGGCAC

13727.2

ACCTAGACAGAAGGTGGGTGAGGGAGGACTGGTAGGAGGCTGAGGCAATTCCTTGGTAGT
TTGTCCTGAAACCCTACTGGAGAAGTCAGCAATGAGGCACCTACTGAGAGAAGTGCCCGA
AACTGCTGACTGCATCTGTTAAGAGTTAACAGTAAAGAGGTAGAAGTGTTTCTGAATCA
GAGTGGAAAGCGTCTCAAGGGTCCACAGTGGAGGTCCCTGAGCTACCTCCCTTCCGTGAGT
GGGAAGAGTGAAGCCCATGAAGAACTGAGATGAAGCAAGGATGGGGTTCCTGGGCTCCA
GGCAAGGGCTGTGCTCTCTGCAGCAGGGAGCCCCACGAGTCAGAAGAAAAGAACTAATCA
TTTGTTCGAAGAAACCTTGCCCGGATACTAGCGGAAAACTGGAGGCGGNGGTGGGGGCAC
AGGAAAGTGGAAAGTGATTGATGGAGAGCAGAGAAGCCTATGCACAGTGGCCGAGTCCAC
TTGTAAGTG

13728.1&2

TTCAAGCAATTGTAAACAAGTATATGTAGATTAGAGTGAGCAAAATCATATACAATTTTCAT
TTCCAGTTGCTATTTTCCAAATGTTCTGTAAATGTCGTTAAAATTACTTAAAAATTAACAAA
GCCAAAAATTAATTTATGACAAGAAAGCCATCCCTACATTAATCTTACTTTTCCACTCAC
CGCCCCATCTCTCTCTCTTTTCTTAAGTATGCCATTAAAAGTGTCTACTGGGCCGGGGC
TGTGGCTCATGCCTGTAAATCCAGCAATTTGGGAGGCCAAGGCAGGCGGATCATGAGGTC
AAGAGATTGAGACCATCCTGGCCAAATGTTGAAACCCCGCTCGACTAAGAATACAAAA
ATTAGCTGGGCATGGTGGCCCATGCTGTAGTGTCACTACTCGGGAGGCTGAGGCAGAA
GAATCGCTTGAACCCGGGAGGCAGAGGATGCAAGTGAAGCCCCGATCGCGCCACTGCACTCT
AGCCTGGGCGACAGACTGAGACTCTGCTC

13731.1&2

TGTGCCAGTCTACAGGCCTATCAGCAGCGACTCCTTCAGCAACAGATGGGGTCCCCCTGTTT
AGCCCAACCCCATGAGCCCCCAGCAGCATATGCTCCCAAATCAGGCCAGTCCCCACACCT
ACAAGGCCAGCAGATCCCTAATTTCTCTCTCCAATCAAGTGCGCTCTCCCCAGCCTGTCCCTT
CTCCACGGCCACAGTCCCAGCCCCCAGTCCAGTCTTCCCCAAGGATGCAGCCTCAGCC
TTCTCCACACCAGTTTCCCCACAGACAAGTTCCCCACATCCTGGACTGGTAGTTGCCAG
GCAACCCCATGGAACAAGGGCATTTTCCAGCC

FIG. 15P

14347.1

CAGATTTTTATTGTCAGTCGTCAGTGGGGCCGTTTCTTGCTGCTTATTTGTCTGCTAGCCTG
CTCTTCCAGCTGCATGGCCAGGCGCAAGGCCTTGATGACATCTCGCAGGGCTGAGAAATGC
TTGGCTTGCTGGGCCAGAGCAGATTCCGCTTTGTTTACAAAGGTCTCCAGGTCATAGTCTG
GCTGCTCGGTTCATCTCAGAGAGCTCAAGCCAGTCTGGTCTTGTGTATGATCTCTTGTAG
CTCTTCCATAGCCTTCTCCTCCAGCTCCCTGATCTGAGTCATGGCTTCGTTAAAGCTGGACA
TCTGGGAAGACAGTTCCCTCCTCTTCCCTGGATAAAATTGCCTGGAATCAGCGCCCCGTTAGA
GCAGGCTTCCATCTCTTCTGTTTCCATTGAATCAACTGCTCTCCACTGGGCCCCACTGTGGG
GGCTCAGCTCCTTGACCCTGCTGCATATCTTAAGGGTGTTTAAAGGATATTCACAGGAGCT
TATGCCTGGT

14347.2

CTCCTCTTGGTACATGAACCCAAGTTGAAAGTGGACTTAACAAAGTATCTGGAGAACCAA
GCATTCTGCTTTGACTTTGCATTTGATGAAACAGCTTCGAATGAAGTTGTCTACAGGTTTAC
AGCAAGGCCACTGGTACAGACAATCTTTGAAGGTGGAAAAGCAACTTGTTTTGCATATGG
CCAGACAGGAAGTGGCAAGACACATACTATGGGCGGAGACCTCTCTGGGAAAGCCAGAA
TGCATCCAAAGGGATCTATGCCATGGCCTTCCGGGACGTCTTCTTCTGAAGAATCAACCT
GCTACCGGAAGTTGGGCTGGAAGTCTATGTGACATTCTTCGAGATCTACAATGGGAAGCT
GTTTGACCTGCTCAACAAGAAGGCCAAGCTTGGCGTGCTGGAAGACGGCAAGCAACAGG
TGCAAGTGGTGGGGGCTTGCAGGAACATCTGONTAACTCTGCTTGATGATGGCANTCAAG
ATGATCGACATGGCCAGCGCTGCAGA

14348.2&14350.1&2

TCCCGAATTCAAGCGACAAATTGGAWACTGAAATGGAAGATGCCTATCATGAACATCAGG
CAAATCTTTTGGCCCAAGATCTGATCAGACGACAGGAAGAATTAAGACGCATGGAAGAAC
TTCACAATCAAGAAATGCAGAAAGCTAAAGAAATGCAATTGAGGCAAGAGGAGGAACGA
CGTAGAAGAGAGCAAGAGATCATGATTGCTCAACGTGAGATGGAAGAACAATGAGGCG
CCAAAGAGAGGAAAGTTACAGCCGAAATGGGCTACATGGATCCACGGGAAAGAGACATGC
GAATGGGTGGCGGAGGACCAATGAACATGGGAGATCCCTATGTTTCAGGAGGCCAGAAA
TTTCCACCTCTAGGAGGTGGTGGTGGCATAGGTTATGAAGCTAATCCTGGCGTTCCACCAG
CAACCATGAGTGGTTCATGATGGGAAGTGACATGGCTACTGAGCGCTTGGCCAGGGAG
GTGCGGGGCTGTGGGTGGACAGGGTCTAGAGGAATGGGGCTGGAAGTCCAGCAGGAT
ATGGTAGAGGGAGAGAAGAGTACGAAGGC

14349.1&2

TTCGTGAAGACCCTCACTGGTAAGACCATCACTCTCGAAGTGGAGCCCGAGTGACACCATT
GAGAATGTCAAGGCAAAAGATCCAAGACAAGGAAGGCATCCCTCCTGACCAGCAKAGGTTG
ATCTTTGCTGGGAAACAGCTGGAAGATGGACGCACCTGTCTGACTACAACATCCAGAAA
GAGTCCACCCTGCACCTGGTGTCTCGGTCTCAGAGGTGGGATGCAAAATCTTCTGTAAGACCC
TGACTGGTAAGACCATCACCTCCAGGTGGAGCCAGTGACACCATCGAGAATGTCAAGG
CAAGATCCAAGATAAGCAAGCCATCCCTCCTGATCAGCAGAGGTTGATCTTTGCTGGGA
AACAGCTGGAAGATGGACGCACCTGTCTGACTACAACATCCAGAAAGAGTCCACTCTGC
ACTTGGTCTGCGCTTGAGGGGGCGGTGTCTAAGTTTCCCTTTTAAAGGTTTCAACAAATTC
ATTGCACTTTCCTTTCAATAAAGTTGTTCATTG

FIG. 15R

13734.1&2

TGTA AAAA CTTG TTTT TAATTTTGTATAAAATAAAAGGTGGTCCATGCCCACGGGGGGCTGTA
GGAAATCCAAGCAGACCAGCTGGGGTGGGGGGATGTAGCCTACCTCGGGGGAGCTGTCTGT
CCTCAAAACGGGCTGAGAAGCCCCGTGAGGGGCCAGGTCCACAGAGAGGCTGGGATA
CTCCCCAACCCGAGGGGCGAGCTGGGCAGTGGGGAGCCCCCATCGTGCCCCAGAGGTGG
CCACAGGCTGAAGGAGGGGCTGAGGCACCGCAGCCTGCAACCCCCAGGGCTGCAGTCCA
CTAACTTTTTACAGAATAAAAGGAACATGGGGATGGGGAAAAAAGCACCAGGTGAGGCA
GGGECGAGGGCCCCAGATCCCAGGAGGGCCAGGACTCAGGATGCCAGCACCACCCTAGC
AGTCCCACAGCTCCTGGCACAGGAGGCCGCCACGGATTGGCACAGGCCGCTGCTGGCCA
TCACGCCACATTTGGAGAACTTGTCCCCACAGAGGTGAGCTCGGAGGAGCTCCTCGTGGGC
ACACACTGTACGAACACAGATCTCCTTGTAAATGACGTACACACGGCGGAGGCTGCGGGG
ACAGGGCACGGGAGGTCTCAGCCCCACTT

13736.2

ATGGCTGCTGGATTTAGGTGGTAATACGGGCTGTGGGCCATAAATCTGAAGCCTTGAGAA
CCTTGGGTCTGGAGAGCCATGAAGAGGGAAGGAAAAGAGGGCAAGTCTGAACCTAACC
AATGACCTGATGGATTGCTCGACCAAGACAGAAAGTGAAGTCTGTGTCTGTGCACTTCCC
ACAGACTGGAGTTTTTGGTGTCTGAATAGACCCAGTTGCTAAAAAATTGGGGGTTTGGTGA
AGAAATCTGATTGTTGTGTGTAATCAATGTGTGATTTTAAAAATAAACAGCAACAACAATA
AAAACCTGACTGGCTGTTTTTCCCTGTATTTTACAATAATTTTTGACCCTCTGAAAA
TTATTATACTTCACCTAAATGGAAGACTGCTGTGTTTGTGGAAAATTTGTAATTTTTTAAT
TATTTTATTCTCTCTCTCTTTTATTTTCCCTGCAGAATCCGTTGAGAGACTAATAAGGCTTA
ATATTTAATTGATTTGT.TAATATGTATATAAAT

13744.2-13696.2

GGCATGCGACCCACTCGCCCGACCGAAGGGCGGCGGGGAGCACACGGAGCACTGCAGG
CGCCGGGTGGGACAGCGCTCTTGGCTGCTGGATAGTCTGTGTTTCCGGGATCGAGGAT
ACTCACCAGAAACCGAATAATCCCGAAGCCAAATCAATGTCCGAGTTACCACCATGGATGCA
GAGCTGGAATTTGCAATCCAGCCAAATCAACTGGAAAACAGCTTTTTGATCAGGTGCTA
AAGACTATCGCCCTCCCGGAAGTGTGCTACTTTGGCCTCCACTATGTGGATAATAAAGGAT
TTCTTACCTGGCTGAAGCTCGATAAGAAAGGTGTCTGCCAGGAGGTGAGGAAGGAGAATC
CCCTCAGTTCAAAGTTCCGGGGCCAAAGTTCTACCTGAAGATGTGGCTGAGGAGCTCATCC
AGGACATCACCCAGAAACTTTCTTCTTCAAGTGAAGGAAGGAATCCTTAGCGATGAGAT
CTACTGCCCCCTTGARACTCCCGTGGCTTGGGGTCTACGCTTGTCCATGCCAAGTTTGG
GGACTACCACCAAGAAG

13746.1&2-13720.1&2

GAAGGAGTCCGGGATACTCAGCAATGATCCACCCCAATTTCAAAGCGGCATTCTTCGGCAG
GTCTCTGGGACAATCTCTAGGGTCACTACCTGGAAACTCGTTAGGGTACAACCTGAATGCTG
AAAGGAAAGAACACCTGCAGAACCGACAGAAATTCACCCCGGCGATCAGCTGATTGATC
TCGGTCCAGCAGAAGTCATGGCTAAAGATGACGAGGACGTTGTCAATTCCTGGGCTTTTC
GAAGTGAGTCCAGCAGCAGTCTGAGGTATTCGGGCGCGTTATGCACCTGGACCACCAGCA
CCAGCTCCCGGGGGGGCCAGGTGCCAGCCTTATCTACATTCCTCAGGGTCTGATCAAAGTT
CAGCTGGTACACCAGGACCGGTACCGCAGCGTCAGGTTGTCCGCTCGGGCTGGGGGACC
GCGGGGACCAGGGAAGCCCGGCGACAGGTTGGAGACCCTGCGGATGCCACAGCCACAGAG
GGTGCTCCCCACCCGCGCGCGCCACCCCGCGGGTTCCGGCTCCAGCAACGGTGGG
GCGAGGCGCTCGTTCTTCTTCTTCTGCTGCTCCAGAGGACGAAGCCGAGGCGG
CCACCACGAGCGTCAGGATTAGCACCTTCGTTTGTAGATGCGGAACCTCATGGTCTCCAG
GGCCGGGAGCGCAGCTACAGCTCGAGCGTCCGGCGCGCGCTAGGAGCCCGGCTCGGCT
TCGTCTCCGTCTCTCCATTACGACCAAGGGTCCCGGAAAAAGCTCAGCCSCGGTCCCAA
CCGCACCTAGCTTCGTTACCTCGGCTCGCTTG

FIG. 15Q

14352.1&2

GCGCGGGTGCGTGGGCCACTGGGTGACCGACTTAGCCTGGCCAGACTCTCAGCACCTGGA
AGCGCCCCGAGAGTGACAGCGTGAGGCTGGGAGGGAGGACTTGGCTTGAGCTTGTTAAAC
TCTGCTCTGAGCCTCCTTGTGCGCTGCATTTAGATGGCTCCCGCAAAGAAGGGTGGCGAGA
AGAAAAAGGGCCGTTCTGCCATCAACGAAGTGGTAACCCGAGAATACACCATCAACATTC
ACAAGCGCATCCATGGAGTGGGCTTCAAGAAGCGTGCACCTCGGGCACTCAAAGAGATTG
GGAAATTTGCCATGAAGGAGATGGGAATCCAGATGTGCGCATTGACACCAGGCTCAACA
AAGCTGTCTGGGCCAAAGGAATAAGGAATGTGCCATACCGAATCCGTGTGCGGCTGTCCA
GAAAACGTAATGAGGATGAAGATTCACCAAATAAGCTATATACTTTGGTTACCTATGTACC
TGTTACCACTTTCAAAAATCTACAGACAGTCAATGTGGATGAGAACTAATCGCTGATCGT

14353.1

AATTCTTTATTTAAATCAACAAACTCATCTTCTCTCAAGCCCCAGACCATGGTAGGCAGCCC
TCCCTCTCCATCCCCTCACCCACCCCTTAGCCACAGTGAAGGGAATGGAAAATGAGAAGC
CAGGAGGGCCCCCTGCCAGGGAAGGCTGCCCCAGATGTGTGGTGAGCACAGTCAGTGACG
TGTGGCTGGGGCAGCAGCTGCCACAGGCTCCTCCTATAAATTAAGTTCTGCAGCCACAG
CTGTGGGAGAAGCATACTTGTAGAAGCAAGGCCAGTCCAGCATCAGAAGGCAGAGGCAG
CATCAGTGACTCCAGCCATGGAATGAACGGAGGACACAGAGCTCAGAGACAGAACAGG
CCAGGGGGAAGAAGGAGAGACAGAAAGGCCAGGGCATGGCGGTGAGGGA

14353.2

TGATCAATCTGGGTGGGCTGGCAGTAGCCCCAGATGATGGCCTCTTCTCTGGGGATCCCAA
CTGGTTCCTAAGAAATCCAAGGAGAAATCCTCGGAATTTCTCGGATAACCAGCTGCAAGA
GGGCAAGAACGTGATCGGCTTACAGATGGCCACCAACCGCGGGGCGTCTCANGCAGGCAT
GACTGGCTACGGCATCCCAAGCCAGATCCTCTGATCCCAACCCAGGCCTTGCCCCCTGCCCT
CCCACGAATGGTTAATATATATAGATATATATTTAGCAGTGACATCCCAAGAGAGCCC
CAGAGCTCTCAAGCTCCTTTCTGTACGGCTGGGGGTTCAAGCCTGTCTGTACCTCTGA
AGTGCCTGCTGGCATCCTCTCCCCCATGCTTACTAATACATTCCCTTCCCCATAGCC

17182.1&2

AGCGGAGCTCCCTCCCTGGTGGCTACAACCCACACAGCCAGGCTCAGGCATCGAGCAG
AACTCCAGCGACTGGGTAACCACTGACATTCAGGTGAAGGTGCGGGACACCTACCTGGAT
ACACAGGTGGTGGGACAGACAGGTGTATCCGAGTGTACGGGGGGCATGTGCTCTGTG
TACCTGAAGGACAGTGAGAAGGTTGTACGATTTCCAGTGAGCACCTGGAGCCTATCACCC
CCACCAAGAACAACAAGGTGAAGTGTATCCTGGGGGAGGATCGGGAAGCCACGGGCGT
CCTACTGAGCATTGATGGTGACGATGGCAATGTCCGTATGGACCTTGATGAGCAGCTCAAG
ATCCTCAACCTCCGCTTCTCGGGAAGCTCCTCGAAGCCTGAAGCAGGCAGGGCCGGTGG
ACTTCGTGGGATGAAGAGTGTATCCTCCTTCCCTGGCCCTTGGCTGTGACACAAGATC
CTCCTGCACGGGCTAGGCGGATGTTCTGGATTTCCTTTGTTTTCTTTTAGGTTTCCATCT
TTTCCCTCCCTGGTGCTCATTTGGAATCTGAGTAGAGTCTGGGGGAGGGTCCCCACCTTCCT
GTACCTCCTCCCCACAGCTTCTTTGTTGTACCGTCTTTCAATAAAAAGAAGCTGTTTGGT
CTA

FIG. 15S

53

17183.2

GGTTCACAGCACTGCTGCTTGTGTGTTGCCGGCCAGGAATTCAGGCTCACAAGGCTATCT
TAGCAGCTCGTTCTCCGGTTTTAGTGCCATGTTTGAACATGAAATGGAGGAGAGCAAAAA
GAATCGAGTTGAAATCAATGATGTGGAGCCTGAAGTTTTTAAGGAAATGATGTGCTTCATT
TACACGGGGAAGGCTCCAAACCTCGACAAAAATGGCTGATGATTTGCTGGCAGCTGCTGAC
AAGTATGCCCTGGAGCGCTTAAAGGTCAATGTGTGAGGATGCCCTCTGCAGTAACCTGTCCG
TGGAGAACGCTGCAGAAATTCTCATCTGGCCGACCTCCACAGTGCAGATCAGTTGAAAA
CTCAGGCAGTGGATTTTCATCAACTATCATGCTTCGGATGTCTTGGAGACCTCTTGGG

17186.1&2

TCGTAGCCATTTTTCTGCTTCTTTGGAGAATGACGCCCACTGACTGCTCATTGTGCTTGGT
TCCATGCCAATTGGTGAAATAGAACCCTCATCCGGTAGTGGAGCCGGAGGGACATCTTGTG
ATCAACGGTGATGGTGCGATTGGAGCATAAGAGAGCTTGGTGTCTCGCCATACAGGGCA
AAGAGGTTGTGACAAAGAGGAGAGATACGGCATGCCTGTGCAGCCCTGATGCACAGTTCC
TCTGCTGTGTAATCTCCACTGCCAGCCGGAGGGGCTCCCTGTCCGACAGATAGAAGATCA
CTTCCACCCCTGGCTTG

17187.1&2

TGGCACACTGCTCTTAAGAACTATGAWGATCTGAGATTTTTTGTGTATGTTTTTACTCT
TTTGAGTGCTAATCATATGTGTCTTATAGATGTACATACCTCCTTGCACAAATGGAGGGG
AATTCATTTTTATCACTGGGAGTGTCTTGTGTATAAAAAACCATGCTGGTATATGGCTTC
AAGTTGTAAAAATGAAAGTGACTTTAAAGAAAAATAGGGGATGGTCCAGGATCTCCACTG
ATAAGACTGTTTTTAAGTAACTTAAGGACCTTTGGGTCTACAAGTATATGTGAAAAAAATG
AGACTTACTGGGTGAGGAAATTCATGTTTTAAAGATGGTGGTGTGTGTGTGTGTGTGTGTG
TGTGTTG
ACTGKGTAAATATATGTGTGATAATGATTGCTTTTTGVCMACTAAAAATTAGGVCTGTATA
AGTWCTARATCCMTCCCTGGCKSTTCATYTTCCMAGATATTGATGATAMCCCTTAAAAATT
GTAACCYGCCTTTTTCCCTTTGCTYTCMAATTAAGTCTATTTCMAAAG

17191.1&39.1

GGGGGTAGGCTCTTTATTAGACGGTTAATGCTGTAACAGGGTCAGAGTGCAGTGTAAGC
AGTGTGAGAGCCCCCGCTTCAGCCCAAGAATGTGGATTTTCTCTCCCTATTGATCACAGTG
GGTGGGTTTCTTCAGAAAACCCCCAGAGGACAGGACCAGTGAAGTCCAAAGGTTAGAAGTG
GAACTGGAAGGCTTCACTCACATGCTGCTTCCACGCTTCCAGGCTGGGCAGCAAGGAGGA
GATGCCCATGACGTGCCAGGTCTCCCATGTGACACCAAGTGAAGTCTGGTAGGACAGCAG
CCGCACGCCTGCCCTGTGCCAGGAGGCCAATCATGGTAGGCAGCATTGCAGGGTCAGAGGT
CTGAGTCCCGAATAGGAGCAGGGGAGGTCCCTGCGGAGAGGCCACTTCTGGCCCTGAAGAC
AGCTCCAATTGAGCCCCCTCCAGTACAGGYGTAGTGCCTTGGACCAAGCCACAGCCTGGTA
AGGGCGCCTGCCAGGGCCACGGCCAGGAGCCA

FIG. 15T

TAATTTCTTAGTCGTTTGGAAATCCTTAAGCATGCAAAAGCTTTGAACAGAAGGGTTACAA
 AGGAACCAGGGTTGTCTTATGGCATCCAGTTAAGCCAGAGCTGGGAATGCCTCTGGGTCAT
 CCACATCAGGAGCAGAAGCACTTGACTTGTGGTCTGCTGCCACGGTTTGGGCGCCCACC
 ACGCCACGTCCACCTCGTCTCCCTGCCGCCACGTCTGGGCGGCCAAGGTCTCCAAAA
 TTGATCTCCAGCTGAGACGTTATATCATTTGCTGGCTTCCGGAAATGATGGTCCATAACCG
 AATCTTCAGCATGAGCCTCTTCACCTCTTGATTATGAAGAACAATCCCTTCTTCCACTGC
 CCATCAGCACCTTCATTTGGTTTTTCGGATATTAATTTCTACTTTTGGCCGGTCTTATTTGA
 ATAGCCTTCCACTCATCCAAAGTCATCTCTTTTGGACCCTCCTCTTTACCTCTTCAACTTCA
 TTCTCCTTATTTTCAGTGTCTGCCACTGGATGATGTCTTTCACCTTCAGGTGTTTCTCAGTC
 ACATTTGATTGATCCAAGTCAGTTAATTCGTCTTTGACAGTTCCCCAGTTGTGAGATCCGCT
 ACCTCCACGTTTGTCTCGTGTTCAGGCCAGATCTATCACTTCCACTATGCCTATCAAATT
 CACGTTTGGCAGGAGAATCAAATCCATCTCTCGGCCCATTCACGTCCACGGCCCCCTCG
 ACCTCTTCCAAGACCACCACGACCTCGAATAGGTGGTCAATAATCGGTCTATCAACTGAA
 AATTGCGCTCCTTACCCCTTTCTTCAAGTGGCTTTTGAATCTTCGTTACAGAGGTGGTGG
 CCTTCTGGTCTTCTATCAATTAATTTCCCTTACCCTGAAGTTGTTGATCAGGTCTTCTTCC
 AACTCGTGC

17193

AAGCGGATGGACCTGAGTCAGCCGAATCCTAGCCCCCTTCCCTTGGCCCTGCTGTGGTGCTC
 GACATCAGTGACAGACCGAAGCAGCAGACCATCAAGGCTACGGGAGGCCCGGGGCGCTT
 GCGAAGATGAAGTTTGGCTGCTCTCTCTTCCGGCAGCCTTATGCTGGCTTTGTCTTAAATG
 GAATCAAGACTGTGGACACCGCTGGCGTCTCTGCTGAGCAGCCACCGGAAGTGTACCA
 TCGCCGTCCACATTCCTCAGCAGGCACTCGGAAGCGGATGCCTGTGGGAGCTGCTGGTGG
 AGAGACTCGGGATGACTCTCTGCTCAGATTACGCCCTTCTCAGGAAAGGGGAAAAGTTTG
 GTCCAGGAGTGATAGCGGGACTCGTTGACATTGGCGAAACTTTGCAATGCCCCGAAGACT
 TAACTCCCGATGAGGTTGTGGAAGTACAAAATCAAGCTGCCTGACCAACCTGAAGCAGA
 AGTACCTGACTGTGATTTCAAAGCCCCAGGTGGTTACTGGAGCCCATACCTAGGAAAGGAG
 GCAACGATGTATTCCAGGTAGACATCCACAGCACCTGATCCCTTTGGGGCATGAAGTGT
 GACAAGTGTGGGCTCTGAAAGGCAATGTTCCRGAGAAACCAGCTAAATCATGGCACCTTC
 AATTTGCCATCGTGACCCAGACCTGTATAAAATTAGGTTAAAGATGAATTTCCACTGCTTTG
 GAGAGTCCACCCACTAAGCACTGTCCATGTAAACAGGTTCTTTGCTCAGATGAAGGAA
 GTAGGGCGCTGGGGCTTCTTGTGTGATGCCCTCTTAGGCCACACAGCCAAATGTCTCAAGTA
 CTTGACCTTAGGGTAGAAGGCAAGCTGCCAGTAAATGTCTCAGCAATTGCTGCTAATTT
 GGTCTGCTAGTTTCTGCAATCTACAAATAAATGTGTTGTAGATGA

FIG. 15U

16443.1.edit

TCGAGCGGCGCCCGGGCAGGTGTCGGAGTCCAGCACGGGAGGCGTGGTCTTGTAGTTGT
TCTCCGGCTGCCCATTTGCTCTCCCACTCCACGGCGATGTCGCTGGGATAGAAGCCTTTGAC
CAGGCAGGTGAGGCTGACCTGGTTCTTGGTCATCTCCTCCCGGGATGGGGGCAGGGTGTAC
ACCTGTGGTTCTCGGGGCTGCCCTTGGCTTTGGAGATGGTTTCTCGATGGGGGCTGGGA
GGGCTTTGTTGGAGACCTTGCACTTGTACTCTTGCCATTCAACCAGTCTGGTGCANGAC
GGT&AGGACGCTNACCACACGGTACGNGCTGGTGTACTGCTCCTCCCGCGGCTTTGTCTTG
GCATTATGCACCTCCACGGCGTCCACGTACCAATTGAACCTGACCTCAGGGTCTTCGTGGC
TCACGTCCACCACCACGCATGTAACCTCAAANCTCGGNCGCGANACGC

16443.2.edit

AGCGTGGTCCGCGCCGAGGTCTGAGGTTACATGCGTGGTGGTGGACGTGAGCCACGAAGA
CCCTGAGGTCAAGTTCAACTGGTACGTGGAC&GCGTGGAGGTGCATAATGCCAAGACAAA
GCGCGGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCTCACCCTCCTGCA
CCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGC
CCCCATCGAGAAAACCATCTCCAAGGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACAC
CCTGCCCCCATCCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAA
AGGCTTCTATCCCAGCGACATCGCCCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACA
ACTACAAGACCACGCCTCCCGTGTGGACTCCGACACCTGCCGGGCGGCGCGCTCGA

16444.2.edit

AGCGTGGTTNCGGCGGAGGTCCCAACCAAGGCTGCANCTGGATGCCATCAAAGTCTTCTG
CAACATGGGAGACTGGTGAGACCTGCGGTGACCCCACTCAGCCAGTGTGGCCAGAGAAGAA
CTGGTACATCAGCAAGAAC&CCAAGGACAAGAGGCATGTCTGGTTCGGCGAGAGCATGAC
CGATGGATTCCAGTTCGAGTATGCGCGCCAGGGCTCCGACCCTGCCGATGTGGACCTGCCC
GGGCGGNCGCTCGA

16445.1.edit

AGCGTGGTCCGCGCCGAGGTCAAGAAC&CGCGCCGACCTGCCGTGACCTCAAGATGTGC
CACTCTGACTGGAAGAGTGGAGACTACTGGATTGACCCCAACCAAGGCTGCAACCTGGAT
GCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGTACCCCACTCAGCCCA
GTGTGGCCAGAGAAGAACTGGTACATCAGCAAGAACC&CAAGGACAAGAGGCATGTCTGGT
TCGGCGAGAGCATGACCGATGGATTCCAGTTCGAGTATGCGCGCCAGGGCTCCGACCCTG
CCGATGTGGACCTGCCCGCGCGCGCGCTCGA

FIG. 15V

16445.2.edit

TCGAGCGGTGCGCCCGGGCAGGTCCACATCGGCAGGGTCGGAGCCCTGGCCGCCATACTCG
AACTGGAATCCATCGGNCATGCTCTCGCCGAACCAGACATGCCTCTTGNCCTTGGGGTTCT
TGCTGATGTACCAGNTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACC
ANTCTCCATGTTGCANAAGACTTTGATGGCATCCAGGTTGCAGCCTTGGTTGGGGTCAATC
CAGTACTCTCCACTCTTCCAGACAGAGTGGCACATCTTGAGGTACAGGCAGGTGCGGGCGG
GGTCTTGACCTCGGTGCGGACCACGCT

16446.1.edit

TCGAGCGGCCGCGCCCGGGCAGGTCTCTCAGAGCGGTAGCTGTTCTTATTGCCCCGGCAGC
CTCCATAGATNAAGTTATTGCANGAGTTCTCTCCACGTCAAAGTACCAGCGTGGGAAGG
ATGCACGGCAAGGCCAGTGACTGCGTTGGCGGTGCAGTATTCTTCATAGTTGAACATATC
GCTGGAGTGGACTTCAGAATCCTGCCTTCTGGGAGCACTTGGGACAGAGGAATCCGCTGC
ATTCTGCTGGTGGACCTCGGCCGCGACCACGCT

16446.2.edit

AGCGTGGTCCGCGGCCGAGGTCCACCAGCAGGAATGCAGCGGATTCTCTGTCCCAAGTGC
TCCCAGAAGGCAGGATTTCTGAAGACCCTCCAGCGATATGTTCAACTATGAAGAATACTG
CACCGCCAACGCAGTCACTGGGCCCTTGGCGTGCATCCTTCCCACGCTGGTACTTTGACGTG
GAGAGGAATCCTGCAATAACTTCATCTATGGAGGCTGCCGGGGCAATAAGAACAGCTAC
CGCTCTGAGGAGGACCTGCCCGGGCGGCCGCTCGA

16447.1.edit

TCGAGCGGCCGCGCCCGGGCAGGTCCACATCGGCAGGGTCGGAGCCCTGGCCGCCATACTCG
AACTGGAATCCATCGGTCATGCTCTCGCCGAACCAGACATGCCTCTTGTCCTTGGGGTTCT
TGCTGATGTACCAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACC
AGTCTCCATGTTGCAGAAGACTTTGATGGCATCCAGGTTGCAGCCTTGGTTGGGGTCAATC
CAGTACTCTCCACTCTTCCAGCCAGAAATGGCACATCTTGAGGTACGGCCANGTGGGGCGG
GGTCTTGACCTCGGCCGCGACACGCT

FIG. 15W

16447.2.edit

AGCGTGGTCGCGGCCGAGGTCAAGAAACCCCGCCCCGACCTGCCGTGACCTCAAGATGTG
CCACTCTGGCTGGAAGAGTGGAGAGTACTGGATTGACCCCAACCAAGGCTGCAACCTGGA
TGCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGTACCCCACTCAGCCC
AGTGTGGCCCAAGAAGACTGGTACATCAGCAAGAACCCCAAGGACAAGAGGCATGTCTGG
CTCGGCGAGAGCATGACCGATGGATTCCAGTTCGAGTATGGCGGCCAGGGCTCCGACCTT
CCCATGTGGACCTGCCCGGGCGGCCGCTCGA

16449.1.edit

AGCGTGGTCGCGGCCGAGGTCTGTGACAGTGGCACTGGTAGAAGNTCCAGGAACCTGA
ACTGTAAGGGTTCTTCATCAGTGCCAACAGGATGACATGAAATGATGTACTCAGAAGTGTG
CTGNAATGGGGCCCATGANATGGTTGNTGAGAGAGAGCTTCTTGTCTACATTCCGGCGG
GTATGGTCTTGGCCTATGCCTTATGGGGGTGGCCGTTGNGGGCGGTGNGGTCCGCCTAAAA
CCATGTTCTCAAAGATCATTTGTTGCCCAACACTGGGTTGCTGACCANAAGTGCCAGGAA
GCTGAATACCATTTCCAGTGTCAATCCAGGGTGGGTGACGAAAGGGGTCTTTTGAAGTGT
GGAAGGAACATCCAAGATCTCTGNTCCATGAAGATTGGGGTGTGGAAGGGTTACAGTTG
GGGAAGCTCGCTGTCTTTTCTTCCAATCANGGGCTCGCTCTTCTGAATATTCTTCAGGGC
AATGACATAAATTTGTATATTCCGGTTCCTCGTTCAGGCCAG

16450.1.edit

TCGAGCGGGCCCGCCCGGCCAGGTCCACCACACCCAATTCCTTGCTGGTATCATGGCAGCCGC
CACGTGCCAGGATTACCGGCTACATCATCAAGTATGAGAAGCCTGGGTCTCTCTCCAGAGA
AGTGGTCCCTCGCCCCCGCCCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGGA
ACCGAATATACAAATTTATGTCAATGGCCCTGAAGAATAATCAGAAGAGCGAGCCCTGATTG
GAAGGAAAAAGACAGACGAGCTTCCCAACTGGTAACCTTCCACACCCCAATCTTCATG
GACCAGAGATCTTGGATGTTCTTCCACAGTTCAAAAGACCCCTTTCGTACCCACCCCTGG
GTATGACACTGGAAATGGTATTACGCTTCTGGCACTTCTGGTCAGCAACCCAGTGTGGG
CAACAAATGATCTTTGANGAACAATGCTTTAGGCGGACCACACCGGCCACAACGGGCACC
CCCATAGGCCATAGGCCAAGAACAATCCGNCGAATGTAGGACAAGAAGCTCTNTCTCAN
ACAANCACTCTCATGGGCCCCCATTCANGACACTTCTGAGTACATCANTTCATGGCATCTG
GTGCCACTGATAAAAACCTTACAGTTA

16450.2.edit

AGCGTGGTCGCGGCCGAGGTCTGTGACAGTGGCACTGGTAGAAGTTCAGGAACCTGA
ACTGTAACGGTTCTTCATCAGTGCCAACAGGATGACATGAAATGATGTACTCAGAAGTGTG
CTGGAATGGGGCCCATGAGATGTTCTGTGAGAGAGAGCTTCTTGTCTACATTCCGGCGGG
TATGGTCTTGGCCTATGCCTTATGGGGGTGCCCGTTGTGGCGGTGTGGTCCGCCTAAAA
CATGTTCTCAAAGATCATTTGTTGCCCAACACTGGGTTGCTGACCAGAAGTGCCAGGAAG
CTGAATACCATTTCCAGTGTCAATCCAGGGTGGGTGACGAAAGCGGTCTTTTGAAGTGTG
GAAGGAACATCCAAGATCTCTGGTCCATGAAGATTGGGGTGTGGAAGGGTTACAGTTGG
GGAAGCTCGTCTGTCTTTTCTTCCAATCANGGGCTCGCTCTTCTGATTATTCTTCAGGGC
AATGACATAAATTTGTATATTCCGNTCCCGGTCNAGCCAATAATAAACCCTCTGTGACA
CCANGGCGGGCCCCCAAGGANCAT

FIG. 15X

16451.1.edit

AGCGTGGTCGCGGCCGAGGTCTCACCAGAGGTACCACCTACAACATCATAGTGGAGGCA
CTGAAAGACCAGCAGAGGCATAAGGTTTCGGGAAGAGGTTGTTACCGTGGGCAACTCTGTC
AACGAAGGCTTGAACCAACCTACGGATGACTCGTGCTTTGACCCCTACACAGTTTCCCATT
ATGCCGTTGGAGATGAGTGGGAACGAATGTCTGAATCAGGCTTTAAACTGTTGTGCCAGTG
CTTANGCTTTGGAAGTGGTCAATTCAGATGTGATTCATCTAGATGGTGCCATGACAATGGT
GTGAACTACAAGATTGGAGAGAAGTGGGACCGTCAGGGAGAAAATGGACCTGCCCCGGGC
GGCCGCTCGA

16451.2.edit

TCGAGCGGCCCGCCCGGGCAGGTCCATTTTCTCCCTGACGGTCCCACTTCTCTCCAATCTTGT
AGTTCACACCATTGTCTATGGCACCATCTAGATGAATCACATCTGAAATGACCACTTCCAAA
GCCTAAGCACTGGCACAACAGTTTAAAGCCTGATTTCAGACATTTCGTTCCCACTCATCTCCA
ACGGCATAATGGGAAACTGTGTAGGGGTCAAAGCACGAGTCATCCGTAGGTTGGTTCAAG
CCTTCGNTGACAGAGTTGCCACGGTAACAACCTCTTCCCGAACCTTATGCCCTCTGCTGGT
CTTTCAGTGCCTCCACTATGATGTTGTAGGTGGTACCTCTGGTGAGGACCTCGGCCGCGAC
CACGCT

16452.1.edit

AGCGTGCCCGCGGCCGAGCTCCATTCGCTGGAACGGCATCAACTTGGAAAGCCAGTGATCG
TCTCAGCCTTGGTTCTCCAGCTAATGGTGAATGGNGGTCTCAGTAGCATCTGTACACGAGC
CCTTCTTCGTGGCGCTGACATTCCTCCAGACTGGTGACAACACCCCTGAGCTGGTCTGCTTGT
AAAGTGTCTTAAGAATCATACACACTCACTTCATAATTTGGCGNCCACCATAAGTCCTGATA
CAACCACGGAATGACCTGTACGGAAC

16452.2.edit

TCGACCGGCCCGCCCGGGCAGGTCTCAGACCGGGTTCTGAGTACACAGTCAGTGTGGTTGC
CTTGACGATGATATGGAGAGCCAGCCCTGATTGGAACCCAGTCCACAGCTATTCTTGCA
CCAAGTACCTGAAGTTCACCTCAGGTACACCCACAAGCCTGAGCGCCCAGTGGACACCA
CCCAATGTTTCAGCTCACTGGATATCGAGTGGGGTGACCCCCAAGGAGAAGACCGGACCA
ATGAAAGAAATCAACCTTGCTCCTGACAGCTCATCCGTGGTTGTATCAGGACTTATGGCGG
CCACCAAAATATGAAGTGAGTGTCTATGCTCTTAAGGACACTTTGACAAGCAGACCAGCTCA
GGGTGTTGTACCACTCTGGAGAAATGTCAGCCCCACCAAGAAGGGCTCGTGTGACAGATGC
TACTGAGACCACCATCACCAATTAGCTGGAGAACCAAGACTGAGACGATCACTGGCTTCCA
AGTTGATGCCGTTCCACCCAATGGACCTCGGCCCGCCACCAGCTT

FIG. 15Y

59

16453.1.edit

AGCGTGGTTCGCGGCCGAGGTCTGCCCCGAAGTGTACAGGGAAGATGTACATGTTA
TAGNTCTTCTCGAAGTCCCGGGCCAGCAGCTCCACGGGGTGGTCTCCTGCCTCCAGGCGCT
TCTCATTCTCATGGATCTTCTTACCCGCGAGTTCTGCTTCTCAGTCAGAAGGTTGTTGTCC
TCATCCCTCTCATAAGGGTGACCAGGACGTTCTTGAGCCAGTCCCGCATGCGCAGGGGGA
ATTCGGTCAGCTCAGAGTCCAGGCAAGCGGGGATGTATTTGCAAGGCCCGATGTAGTCCA
AGTGGAGCTTGTGGCCCTTCTTGGTGCCCTCCAAGGTGCACTTTGTGGCAAAGAAGTGGCA
GGAAGAGTCGAAGGTCTTGTGTCAATTGCTGCACACCTTCTCAAAGTCCGCAATGGGGGCT
GGGCAGACCTGCCCCGGCGGCCGCTCGA

16453.2.edit

TCGAGCGGCCGCCCCGGGCAGGTCTGCCCCAGCCCCATTGGCGAGTTTGAGAAGGNGTGCA
GCAATGACAACAAGACCTTCGACTCTTCTGECACCTTCTTTGCCACAAAGTGCACCCTGGA
GGGCACCAAGAAGGGGCCACAAGCTCCACCTGGACTACATCGGGCCTTGCAAATACATCCC
CCCTTGCTGGACTCTGAGCTGACCGAATTCCTGCGCATGCGGGACTGGCTCAAGAAC
GTCTGGTCAACCTGTATGAGAGGGATGAGGACAACAACCTTCTGACTGAGAAGCANAAG
CTGCGGGTGAAGAANATCCATGAGAATGANAAGCGCTGNAGGCANGAGACCACCCCGT
GGAGCTGCTGCCCCGGGACTTCGAGAAGAATAACATGTACATCTTCCCTGTACACTGG
CAGTTCGGCCAGACCTCGCCCCGGACACGCT

16454.1.edit

AGCGTGGNTGCGGACGACGCCCCACAAAGCCATTGTATGTAGTTTTANTTCAGCTGCAAAN
AATACCNCCAGCATCCACCTTACTAACCAGCATATGCAGACA

16454.2.edit

TCGAGCGGTGCCCCGGGCAGGTCTGCCCCGATAGCACCGGGCATATTTTGAATGGATGA
CGTCTGGCACCTTGAGCAGCCCAGCGAGCACTTGGTCTTAGTTGAGCAATTTGGCTAGGA
GGATAGTATGCAGCACGGTTCTGAGTCTGTGGGATAGCTGCCATGAAGNAACCTGAAGGA
GGCGCTGGCTGGTANGGCTTGATTACAGGCTGGGAACAGCTCGTACACTTGCCATTCTCT
GCATATACTGGNTACTGAGGCGAGCCTGCGGCTCTTCTTTGCGCTGAGCTAAAGCTACATA
CAATGGCTTTGNGGACCTCGGCCGCGACACGCTT

FIG. 15Z

16455.1.edit

TCGAGCGGGCCCGGGCAGGTCCATTTTCTCCCTGACGGTCCCACTTCTCTCCAATCTTGT
AGTTCACACCAATTGTATGACACCATCTAGATGAATCACATCTGAAATGACCACTTCCAAA
GCCTAAGCACTGGCACAACAGTTTAAAGCCTGATTAGACATTGTTCCCACTCATCTCCA
ACGGCATAATGGGAACTGTGTAGGGGTCAAAGCACGAGTCATCCGTAGGTTGGTTCAAG
CCTTCGTTGACAGAAGTTGCCCACGGTAACAACCTCTTCCCGAACCTTATGCCTCTGCTGGT
CTTTCAAGTGCTCCACTATGATGTTGTAGGTGGCACCTCTGGTGAGGACCTCGGCCCGGA
CCACGCT

16455.2.edit

AGCGTGGTTTGCGGCCGAGGTCTCACCANAGGTGCCACCTACAACATCATAGTGGAGGC
ACTGAAAGACCAGCAGAGGCATAAGGTTTCGGGAAGAGGTTGTTACCGTGGGCAACTCTGT
CAACGAAGGCTTGAACCAACCTACGGATGACTCGTGCTTTGACCCCTACACAGNTTCCCAT
TATGCCGTTGGAGATGAGTGGGAACGAATGTCTGAATCAGGCTTTAAACTGTTGTGCCAGT
GCTTANGCTTTGGAAGTGGTCATTTAGATGTGATTATCTANATGGTGTGATGACAATGG
TGNGAACTACAAGATTGGAGAGAAAGTGNACCGTCAGGGGANAAAAATGGACCTGCCCGG
GCGGCNCGCTCGA

16456.1.edit

AGCGTGGTTCGGCGCCGAGGTCTGGCTTCTGCTCANGTGATTATCCTGAACCATCCAGGCC
AAATAAGCGCCCGCTATGCCCCGTGNAATTGGATTGCCACACGGCTCACATTGCATGCAAGTT
TGCTGAGCTGAAGGAAAAGATTGATC

16456.2.edit

TCGAGCGGGCCCGGGCAGGTCCAAATGAAACAAACAGTTCTGAGACCGTTCTTCCACCA
CTGATTAAGAGTGGCGGNGCGCGGTATTAGGGAATAATTCATTTAGCCTTCTGAGCTTCT
GGGCAGACTTGGTGACCTTCCCAGCTCCAGCAGCTTCTGGTCCACTGCTTTGATGACACC
CACCGCAACTGTCTGTCTCATATCAGCAACAGCAAAGCGACCCAAAGGTGGATAGTCTGA
GAAGCTCTCAACACACATGGGCTTCCCAGGAACCATATCAACAATGGGCAGCATCACCAG
ACTTCAAGAATTTAAGGGCCATCTTCCAGCTTTTACCAGAACGGCGATCAATCTTTTCCTT
CAGCTCAGCAAACCTTGCAATGATGTGAGCCG

FIG. 15AA

16459.1.edit

TCGAGCGGCCGCCCCGGGCAGGTCCAGAGGGCTGTGCTGAAGTTTGCTGCTGCCACTGGAG
CCTCTCCAATTGCTGGCCGCTTCACTCCTGGAACCTTCACTAACCCAGATCCAGGCAGCCTT
CCGGGAGCCACGGCTTCTTGTGGNTACTGACCCAGGGCTGACCACCAGCCTCTCACGGAG
GCATCTTATGTTAACCTACCTACCATTTGCGCTGTGTAACACAGATTCTCCTCTGCGCTATGT
GGACATTGCCATCCCATGCAACAACAAGGGAGCTCACTCAGNGGGGTTTGATGTGGTGGA
TGCTGGCTCGGGAAGTTCTGCGCATGCGTGGCACCATTTCCTGTAACACCCATGGGANGN
CATGCCTGATCTGGACTTCTACAGAGATCCTGAAGAGATTGAAAAAGAAGAACAGGCTGN
TTGCTGANAAAGCAAGTGACCAAGGANGAAATTCANGGGTGAAANGGACTGCTCCCGCT
CCTGAATTCAGTCTACTCAACCTGANGNTGCAGACTGGTCTTGAAGGNGNACANGGGCC
CTCTGGGCCTATTTAAGCANCTTCGGTCGCGAACACGNT

16459.2.edit

AGCGTGNGTCGCGGCCGAGGTGCTGAATAGGCACAGAGGGCACCTGTACACCTTCAGACC
AGTCTGCAACCTCAGGCTGAGTAGCAGTGAATCAGGAGCGGGAGCAGTCCATTACCCCT
GAAATTCCTCCTTGGNCACTGCCTTCTCAGCAGCAGCCTGCTCTTCTTTTCAATCTCTTCA
GGATCTCTGTAGAAGTACAGATCAGGCATGACCTCCCATGGGTGTTACGGGAAATGGTG
CCACGCATGCGCAGAACTTCCCGAGCCAGCATCCACCACATCAAACCCACTGAGTGAGCT
CCCTTGTGTGTGATGGGATGGGCAATGTCCACATAGCGCAGAGGAGAATCTGTGTTACAC
AGCGCAATGGTAGGTAGGTAAACATAAGATGCCTCCCGAGAAAGCTGGTGGTCAGCCCTG
GGGTCAAGTAACCACAAGAAGCCGTGGCTCCCGGAAGGCTGCCTGGATCTGGTTAGTGAA
GGNTCCAGGAGTGAACCCGGCCAACAATTGGAGTGGCTTCAGTGGCAAGCAGCAAACTTCA
GCACAAGCCCTCTGGACCTGCCCCCGCGCGCTCGA

16460.1.edit

TCGAGCGGCCGCCCCGGGCAGGTCCAATTTCTCCCTGACCGNCCCACTTCTCTCCAATCTTGT
AGTTCACACCATTTGTATGGCACCATCTAGATGAATCACATCTGAAATGACCACTTCCAAA
GCCTAAGCACTGGCACAACAGTTTAAAGCCTGATTGAGACATTCGTTCCCACTCATCTCCA
ACGGCATAATGGGAAACTGTGTAGGGGTCAAAGCAGAGTCAATCCGTAGGTTGGTTCAAG
CCTTCGTTGACAGAGTTGCCCCAGGTAACAACCTCNTCCCCGAACCTTAAGCCTCTGCTGG
GCTTTCAGNCCCTCCACTATGATGNTGTAGGGGGGCACCTCTGGNGANGACCTCGGCCCC
GACCACGCT

16460.2.edit

AGCGTGGTCGCGGCCGAGGTCTCACCAGAGGTGCCACCTACAACATCATAGTGGAGGCA
CTGAAAGACCAGCAGAGGCATAAGGCTCGGGAAGAGGTTGTTACCGTGGGCAACTCTGTC
AACGAAGGCTTGAACCAACCTACGGATGACTCGTGCTTTGACCCCTACACAGTTTCCCAT
ATGCGGTTGGAGATGACTGGGAACGAATGTCTGAATCAGGCTTTAACTGTTGTGCCAGTG
CTTANGCTTTGGAAGTGGGTCAATTCAGATGTGATTATCTAGATGGTGGCATGACAATGG
NGNGAACTACAAGATTGGAGAGAACTGGNACCGNCAGGAGAAAAATGGACCTGCCCGGG
CGGCCCGCTCGA

FIG. 15BB

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16461.1.edit

AGCGTGGTTCGCGGCCGAGGTCCACATCGGCAGGGTTCGGAGCCCTGGCCGCCATACTCGAA
CTGGAATCCATCGGTTCATGCTCTCGCCGAACCAGACATGCCTCTTGTCTTGGGGTTCTTGC
TGATGTACCAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACCAGT
CTCCATGTTGCAGAAGACTTTGATGGCATCCAGGNTGCAACCTTGGTTGGGGTCAATCCAG
TACTCTCCACTCTTCCAGCCAGAGTGGCACATCTTGAGGTCACGGCAGGTGCGGNCGGGGG
NTTTGCGGCTGCCCTCTGGNCTTCGGNTGTNCTCNATCTGCTGGCTCA

16461.2.edit

TCGAGCGGCCGCCCCGGGCAGGTCTCGCGGTTCGCACTGGTGATGCTGGTCTGTGGTCCCC
CCGGCCCTCCTGGACCTCCTGGCCCCCTGGTCTCCAGCGCTGGTTTCGACTTCAGCTTC
CTGCCCCAGCCACCTCAAGAGAAGGCTCAGGATGGTGGCCGCTACTACCGGGCTGATGAT
GCCAATGTGGTTCGTGACCGTGACCTCGAGGTGGACACCCCTCAAGAGCCTGAGCCAG
CAGATCGAGAACATCCGGAGCCCCAGAGGGCAGNCGCAAGAACCCCGCCGCACCTGCCGT
GACCTCAAGATGTGCCACTCTGACTGGAAGAGTGGAGAGTACTGGATTGACCCCAACCA
GCTGCAACCTGGATGCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGTA
CCCCACTCAGCCAGTGTGCCCAAAAAGAACTGGTACATCAGCAAGAACCCCAAGGACAA
GAAGCATGTCTGGTTCGGCGAGAACATGACCGATGGATTCCAGTTCGAGTATGGCGGGCA
GGGCTCCGACCCTGCCGATCGGGACCTTGGCCGCGAACACGCT

16463.1.edit

AGCGTGGNNCGCGCCGAGGTATAAATATCCAGNCCATATCCTCCCTCCACACGCTGANAG
ATGAAGCTGTNCAAAGATCTCAGGGTGGANAAAACCAT

16463.2.edit

TCGAGCGGCCGCCCCGGGCAGGTCTTCAGACTTGGACTGTGTCACTGCCAGGCTTCCAG
GGCTCCAACCTTGACAGACGGCTGTCTGTCGACAGTCTCTGTAATCGCGAAAGCAACCATG
GAAGACCTGGGGGAAAACACCATGGTTTATCCACCTGAGATCTTTGAACAACCTTCATCT
CTCAGCGTGGCGAGGGAGGCTCTGGAATGATATTTCTACCTCGGCCGCGACCACGCT

FIG. 15CC

1.3

16464.1.edit

CGAGCGGGCGACCGGGCAGGTNCAGACTCCAATCCANANAACCATCAAGCCAGATGTCAG
AAGCTACACCATCACAGGTTTACAACCAAGGCACTGACTACAAGANCTACCTGCACACCTTG
AATGACAATGCTCGGAGCTCCCTGTGGTCAATCGACGCCTCCACTGCCATTGATGCACCAT
CCAACCTGCGTTTCTGGCCACCACACCAATTCCTTGCTGGTATCATGGCAGCCGCCACG
TGCAGGATTACCGGTACATCATCNAGTATGANAAGCCTGGGCCTCCTCCCAGAGAAGNG
GTCCCTCGGCCCCCGCCCTGNTGTCCCANAGGNTACTATTACTGNGCCNGCAACCGGCAACC
GATATCNATTTTGNCAATTGGCCTTCAACAATAATTA

16464.2.edit

AGCGTGGTTCGCGGCCGANGTCCTGTGAGAGTGGCACTGGTAGAAGTTCCAGGAACCCCTG
AACTGTAAGGGTTCTTCATCAGNGCCAACAGGATGACATGAAATGATGTACTCAGAAGTG
TCCTGGAATGGGGCCCATGAGATGGTTGTCTGAGAGAGAGCTTCTGNCCTGTCTTTTCC
TTCCAATCAGGGGCTCGCTCTTCTGATTATTCTTCAGGGCAATGACATAAAATTGTATATTG
GGTCCCGGNTCCAGGCCAGTAATAGTANCCTCTGTGACACCAGGGCGGNGCCGAGGGACC
ACTTCTCTGGGAGGAGACCCAGGCTTCTCATACTTGATGATGTAACCGGTAATCCTGGCAC
GTGGCGGCTGCCATGATACCAGCAAGGAATTGGGGTGTGGTGGCCAGGAAACGCAGGTTG
GATGNGCATCAATGGCAGTGGAGGCCGTGATGACCACAGGGGGAGCTCCGACATTGTC
ATTCAAGGTG

16465.1.edit

AGCGTGGNCGCGGCCGAGGTGCAGCGCGGGCTGTGCCACCTTCTGCTCTCTGCCCCAACGAT
AAGGAGGGTNCCTGCCCCCAGGAGAACATTAACNTCCCCAGCTCGGCCTCTGCCCG

16465.2.edit

TCGAGCGCCCGCCCGCGGCAGGTTTTTTTGGTGAAGTGGNTACTTTATTGGNTGGGAAAG
GGAGAAGCTGTGGTCAAGCCCAAGAGGGAATACAGAGNCCCGAAAAAGGGGAGGGCAGGT
GGGCTGGAACAGACCGCAGGGCCAGGCAGAACTTTCTCTCCTCACTGCTCAGCCTGGTG
GTGGCTGGAGCTCANAAATTGGGAGTGACACAGGACACCTTCCACAGCCATTGCGCGGG
CATTTCACTGCCCAGGACACTGGCTGTCCACCTGGCACTGGTCCCGACAGAAGCCCCGAGC
TGGGGAAAGTTAATGTTACCTGCGGGCAGGAACCTCCTTATCATTTGNGCAGAGAGCAG
AAGGTGGCACAGCCCCGCGCTGCACCTCGGCTCCGACCACGCT

16466.2.edit

TCGAGCGCCCGCCCGGGCAGGTCCACCATAAGTCCTGATACAACCACGGATGAGCTGCA
GCAGCAAGGTTGATTTCTTTCAATGGTCCGGNCTTCTCCTTGGCGGNCACCCGCACTCGAT
ATCCAGTGAGCTGAACATTGGCTGGCTCCACTGGGCGCTCAGGCT

16467.2.edit

TCGAGCGGTTGCCCCGGGCAGGTCCACCACACCCCAATTCCTTGCTGGTATCATGGCAGCCG
CCACGTGCCAGGATTACCGGCTACATCATCAAGTATGAGAAGCCTGGGTCTCCTCCCAGAG
AAGCGGTCCCTCGGCCCCCGCCCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGG
AACCGAATATACAATTTATGTCAATGNCCTGAAGAATAATCANNAANAGGGANCCCCCTGA
TTGGAAGGA

FIG. 15DD

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Parameter	Unit	Value
Initial concentration of Fe^{2+} ions	mol dm^{-3}	0.01
Initial concentration of Fe^{3+} ions	mol dm^{-3}	0.01
Initial concentration of H_2O_2	mol dm^{-3}	0.01
Initial concentration of H^+	mol dm^{-3}	0.1
Temperature	$^\circ\text{C}$	25
Time	s	0 to 1000
Concentration of Fe^{2+} ions	mol dm^{-3}	0.01
Concentration of Fe^{3+} ions	mol dm^{-3}	0.01
Concentration of H_2O_2	mol dm^{-3}	0.01
Concentration of H^+	mol dm^{-3}	0.1
Rate of reaction	$\text{mol dm}^{-3} \text{ s}^{-1}$	0.001
Order of reaction with respect to Fe^{2+}		1
Order of reaction with respect to Fe^{3+}		1
Order of reaction with respect to H_2O_2		1
Order of reaction with respect to H^+		1
Overall order of reaction		4
Rate constant k	$\text{mol}^{-3} \text{ dm}^9 \text{ s}^{-1}$	0.001
Half-life $t_{1/2}$	s	1000
Time to reach 90% completion	s	1000
Time to reach 95% completion	s	1000
Time to reach 99% completion	s	1000
Time to reach 99.9% completion	s	1000
Time to reach 99.99% completion	s	1000
Time to reach 99.999% completion	s	1000
Time to reach 99.9999% completion	s	1000
Time to reach 99.99999% completion	s	1000
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Time to reach 99.999999999999999999999% completion	s	1000
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Time to reach 99.99999999999999999999999999999% completion	s	1000
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Time to reach 99.999999999999999999999999999999999999% completion	s	1000
Time to reach 99.9999999999999999999999999999999999999% completion	s	1000
Time to reach 99.99999999999999999999999999999999999999% completion	s	1000
Time to reach 99.999999999999999999999999999999999999999% completion	s	1000
Time to reach 99.99% completion	s	1000
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Time to reach 99.99% completion	s	1000
Time to reach 99.999% completion	s	1000
Time to reach 99.99% completion	s	1000
Time to reach 99.999% completion	s	1000
Time to reach 99.99% completion	s	1000
Time to reach 99.999% completion		

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03_16470.edit

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05_16471.edit

TCGAGCGCCCGCCCGGGCAGGTCTCCCTCTTGCGGCCACAGGGGCAGCGCATAGTGGGAC
TCGTACCACTGTGCGTACGGGTGTGCTGTGGATGAGCACGATGCAATTCTTCACCAGGCTCT
TGGTACGAACCAGCTCGTTATTAGATGCATTGTAGACAACATCGATGATCCTTGTTTTACG
AGTACAACACTCTGAGCCCCAGGAGAAATTCGCCACGTCCAACCTCAGGGCAGGTTATTTT
TTGTTACCTCCCCGCACACGGACTGTGTGGATGCCGCGCGGGCCAAAGCTGACTCCTGAGGA
ADAAGAGATTTTAAACAATAAACGATCTAAAAAAATTCAGAAGAAATATGATGAAAGGA
AAAAAATGCCAAATCAGCAGTCTCCTGGAGGAGCAGTTCCAGCAGGGCAAGCTTCTTG
CGTGCAATCGCTTCAAGGCCCCGACAGTGTGACCGAGCAGATGGCTATGTGCTAGAGGGCA
AAGAAGTGGAGTTCTATCTTAAGAAAATCAGGCCCCAGAAATGGCTGNGTCTTCAACTAATC
CAAAGGGGAGTTTCAGACCAAGTGCAATCAGCAAAAAACATTGATGACTGNTGGCCAAATTTA
TTGGTGCAGGGCTTGACANTANGANNGGCTGGGTCTTGGGGCTTGCAATCGNACAAGCT
TTGGCAGCCTTTTCTTTGGTTTGGCAAAAACCTTTTGTGTAAGANGANACCTNNGGGCGGA
CCCCTTAACCGATTCCACNCCNCGNCGCGTTCTANGGNCCCNCTTG

FIG. 15EE

06_16471.edit

AGCGTGGTCGCGGCCGAGGTCTGCTGCTTCAGCGAAGGGTTTCTGGCATAACCAATGATA
AGGCTGCCAAAGACTGTTCCAATACCAGCACCAGAACCAGCCACTCCTACTGTTGCAGCAC
CTGCACCAATAAAATTTGGCAGCAGTATCAATGTCTCTGCTGATTGCACTGGTCTGAAACTC
CCTTTGGATTAGCTGAGACACACCAATCTGGGGCCCTGATTTTCTAAGATAGAACTCCAAC
TCTTTGCCCTCTAGCACATAGCCATCTGCTCGGTACACTGTCCCGGCCCTGAAGCGATGC
ACGCAAGAAGCTTGGCCCTGCTGGAAGTCTCTCCAGGAGACTGCTGATTTTGGCATTCTT
TTTCCTTTTCATCATATTTCTTCTGAATTTTTTAGATCGTTTTTGTTTAAATCTCTTCTTCC
TCAGGAGTCAGCTTGGCCCCCGCCGATCCACACAGTCCCGTGTGCGGGGAGGTAACAAGA
AATACCGTGCCCTGAGGTTGGACGTGGGGAATTTCTCTGGGGCTCAGAGTGGTGTACTCG
TAAACAAGGATCATCGATGGTGNCTACAATGCATCTAATAACGAGCTGGGTCCGACCCA
AAGAACCTGGNGAANAAATGGATCGNCTCATCGACAGGACACCGTACCCGACAGGGGNA
CGANTCCCACTATGCGCTTGGCCCTGGGCCGCAANAAAGGAAAAGTGGCCGGGCGGCCNT
CGAAAGCCCCAATTNTGGAAAAATCCATCACTGGGNGGCCNGTCGAGCATGCATNTAN
AGGGGCCCATCCCCCTNANN

07_16472.edit

TCGAGCGGCCCGCCCGGGCAGGTCCCCAACCAAGGCTGCAACCTGGATGCCATCAAAGTCT
TCTGCAACATGGAGACTGGTGAGACCTCCGTGTACCCCACTCAGCCAGTGTGGCCGAGA
AGAACTGGTACATCAGCAAGAACCCCAAGGACAAGAGGCATGTCTGGTTCGGCGAGAGCA
TGACCGATGGATTCCAGTTGAGTATCGCGGCCAGGGCTCCGACCCTGCCGATGTGGACCT
CGGCCGCGACACGCT

08_16472.edit

AGCGTGGTCGCGGCCGAGGTCCACATCGGCAGGGTCGGAGCCCTGGCCGCCATACTCGAA
CTGGAATCCATCGGTATGCTCTCGCCCAACCAGACATGCCTCTTGTCTTGGGGTTCTTGC
TGATGTACCAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACCAGT
CTCCATGTTGCAGAAGACTTTGATGGCATCCAGGTTGCAGCCTTGGTTGGGGACCTGCCCG
GGCGGCCGCTCGA

09_16473.edit

TCGAGCGGCCCGCCCGGGCAGGTCCACCACACCCAATTCCTTGCTGGTATCATGGCAGCCGC
CACGTGCCAGGATTACCGGCTACATCATCAAGTATGAGAAGCCTGGGTCTCTCCAGAGA
AGTGGTCCCTCGGCCCGCCCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGGA
ACGGAATATACAATTTATGTCAATGCCCTGAAGAATAATCAGAAGAGCGAGCCCTGATTG
GAAGGAAAAAGACAGACGAGCTTCCCCAAGTGGTAACCCCTTCCACACCCCAATCTTCATG
GACCAGAGATCTTGGATGTTCTTCCACAGTTCAAAAGACCCCTTTCGTACCCACCCCTGG
GTATGACACTGGAAATGGTATTCAGCTTCTTGGCACTTCTGGTCAGCAACCCAGTGTGGG
CAACAAATGATCTTTGAGGAACATGGNTTTAGGCCGGACCACACCGCCACAAACGGCCACC
CCCATAAAGGCATAGGCCAAGACCATACCCGCGGAATGTAGGACAAGAAGCTNTNTNNTCAN
ACACCATNTNATGGGCCCCATTCCAGGACACTTCTGAGTACATCATTTATGNCACTGTGG
CACTTGATGAAAACCCCTTACAGTTGAGGTTCTGGAACCTTTACCAGCCCTNTTACAGGAC
TNGCCCGGACNCTTAAGCCNATTNACCCCTGGGGCGTTCTANGGTCCCACTCGNNCACTG
NGAAAAATGGCTACTGTN

FIG. 15FF

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Abstract

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FIG. 15GG

14_16475.edit

AGCGTGGTTCGCGGCCGAGGTGTTTTATGACGGGCCCCGGTGCTGAAGGGCAGGGAACAAC
TGATGGTGCTACTTTGAAGTCTTTCTTTCTCTTTTGCACAAAGAGTCTCATGTCTGA
TATTTAGACATGATGAGCTTTGTGCAAAAGGGGAGCTGGCTACTTCTCGCTCTGCTTCATC
CCACTATTATTTTGGCACAACAGGAAGCTGTTGAAGGAGGATGTTCCCATCTTGGTCAGTC
CTATGCGGATAGAGATGTCTGGAAGCCAGAACCATGCCAAATATGTGTCTGTGACTCAGG
ATCCGTCTCTGCGATGACATAATATGTGACGATCAAGAATTAGACTGCCCCAACCCAGAA
ATTCCATTTGGAGAATGTTGTGTCAGTTTGGCCACAGCCTCCAACTGCTCCTACTCGCCCTCC
TAATGGTCAAGGACCTCAAGGCCCAAGGGAGATCCAGGCCCTCCTGGTATTCTGGGGAG
AAATGGTGACCTGGTATTCCAGGACAACCAGGGTCCCCTGGTTCTCCTGGCCCCCTGGA
ATCNGGNGAATCATGCCCTACTGGTCTCAAACCTATTCTCCANATGATTATATGATGTC
AAGTCTGGGATAGCNAGTANGGANGGACTCGCAGGCTATTCTGGACCANACCTGCCGGGG
GGCGTTCGAAAGCCCCGAATCTGCANANTNCTTACACTGGCGGCCGTCGAGCTGCTTT
AAAAGGGCCATTCCNCTTTAGNGNGGGGGANTACAATTACTNGGCGGCCGTTTANANCG
CGNGNCTGGGAAAT

15_16476.edit

AGCGTGGTTCGCGGCCGAGGTCCACATCGGCAGGGTCCGAGCCCTGGCCGCCATACTCGAA
CTGGAATCCATCGGTCA TGCTCTGCGCGAACCAGACATGCCTCTTGCTTTGGGGTTCTTGC
TGATGTACCAGTTCTTCTGGCCCACTGGGCTGAGTGGGGTACACGCAGGTCTCACCAGT
CTCCATGTTGCAGAAGACTTTGATGGCATCCAGTTGCCAGCCTTGGTTGGGGTCAATCCAG
TACTCTCCACTCTTCCAGTCAGAGTGGCACA TCTTGAGGTCACGGCAGGTGCGCGCGGGGT
TCTTGGCGCTGCCCCCTCTGGGCTCCGGA TGTCTCGATCTGCTGGCTCAGGCTCTTGAGGGTG
GTGTCCACCTCGAGGTACGGGTACCGAACCACATTGGCATCATCAGCCCGGTACTAGCGGC
CACCATCGTGAGCCTTCTCTTGANGTGGCTGGCGCAGGAAGTGAAGTCGAAACCAGCGCT
GGGAGGACCAGGGGGACCAANAGGTCCAGGAAGGGCCCCGGGGGACCAACAGGACCAG
CATCACCAAGTGGCACC CGGAGAACCTGCCCGGCCGNCCTCGAA

16_16476.edit

TCGAGCGNCGCCCGGGCAGGTCTCGCGGTGGCACTGGTGATGCTGGTCTGTTGGTCCCC
CCGCCCCCTCTGGACCTCTGGTCCCCCTGGTCTCCAGCGCTGGTTTCGACTTCAGCTTC
CTGCCCCAGCCACCTCAAGACAAGGCTCAGGATGGTGGCCGCTACTACCGGGCTGATGAT
GCCAATGTGGTTCTGTGACCGTGACCTCGAGGTGGACACCACCTCAAGAGCCTGAGCCAG
CAGATCGAGAACATCCGGAGCCCAAGAGGGCAGCCGCAAGAACCCCGCCCCGACCTGCCGT
GACCTCAAGATGTGCCACTCTGACTGGAAGAGTGGAGAGTACTGCAATTGACCCCAACCA
GGCTGCAACCTGGATGCCATCAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCGTGT
ACCCCACTCAGCCCAAGTGTGGCCAGAGCAAGCACTGGTACATCAGCAAGAACCCCAAGGACA
AGAGCCATGTCTGGTTGGCCGAGAGCATGACCGATGGATTCCAGTTCCAGTATGGCGGCC
AGGGCTCCCACCTGCCGATGTGGACCTCGCGCCCGGACCACTT

FIG. 15HH

17_16477.edit

TNGAGCGGCGCCCGGGCAGGNTGNNAACGCTGGTCTGCTGGTCCTCTGGCAAGGCTG
GTGAAGATGGTCACCCTGGAAAACCCGGACGACCTGGTGAGAGAGGAGTTGTTGGACCAC
AGGGTGGCTCGTGGTTTCCCTGGAACTCCTGGACTTCTGGCTTCAAAGGCATTAGGGGACA
CAATGGTCTGGATGGATTGAAGGGACAGCCCGGTGCTCCTGGTGTGAAGGGTGAACCTGG
TGCCCTGGTGAAAATGGAACCTCCAGGTCAAACAGGAGCCCGTGGGCTTCTGGTGAGAG
AGGACCGTGTGGTGCCCTGGCCCANACCTCGGCCGCGACCACGCTAAGCCCGAATTTCC
AGCACACTGGNGGCCGTTACTANTGGATCCGAGCTCGGTACCAAGCTTGGCGTAATCATG
GTCATAGCTGTTTCTGNGTGAAATTGTTATCCGCTCACAATTCACACANCATACGAAGC
CGGAAAGCATAAAGTGTAAGCCTTGGGGTGCTAATGAGTGAGCTAACTCNCATTAAATT
GCGTTGCGCTCACTGCCCGCTTTTCCANNNGGAAAACNTGGCNTNGCCNGCTTGCNTTAA
NTGAAATCCGCCNACCCCGGGGAAAAGNCGGTTTGCGTATTTGGGGCNCTTTTCCCTTT
CCTCGGNTTACTTGANTTANTGGGCTTTGCGNCGNTTCGGGTTGNGGCGANCNGGTTCAACN
TCACNCCAAAGGNGGNAANACGGTTTCCCANAAATCCGGGGGNTANCCCAANGNAAAAC
ATNNGNCNAANGGGCT

18_16477.edit

AGCGTGGTTNGCGGCCGAGGTCTGGGCCAGGGGCACCAACACGTCTCTCACCAGGAA
GCCACGGGCTCCTGTTTGACCTGGAGTTCCATTTTACCAGGGGCACCAGGTTACCCTT
CACACCAGGAGCACCGGGCTGTCCCTTCAATCCATNCAGACCATTTGNGCCCTAATGCCT
TTGAAGCCAGGAAGTCCAGGAGTTCCAGGGAACACCGAGCACCTGTGGTCCAACAAC
TCCTCTCTCACCAGGTGCTCGGGGTTTCCAGGTTGACCATCTTACCAGCCTTGCCAGGA
GGACCAGCAGGACCAGCGTTACCAACCTGCCCGGGCGGGCGCTCGA

21_16479.edit

TCGACCGGCGCCCGGGCCAGGTCCAATTTCTCCTGACGGTCCCCTTCTCTCCAATCTTGT
AGTTCACACCATTTGTCAATGGCACCATCTAGATGAATCACAATCTGAAATGACCCTTCCAAA
GCCTAAGCACTGGCACAAACAGTTTAAAGCCTGATTCAGACATTCGTTCCCACTCATCTCCA
ACGGCATAATGGGAACCTGTGTAGGGGTCAAAGCACGAGTCATCCGTAGGTTGGTTCAAG
CCTTCGTTGACAGAGTTGCCACCGTAACAACCTCTTCCCGAACCTTATGCCTCTGCTGGTC
TTTCACTGCCTCCACTATGATGTTGTAGGTGGCACCTCTGGTGAGGACCTCGGCCCGGACC
ACGCT

22_16479.edit

AGCGTGGTCCGGCCGAGGTCTCACCAGAGGTGCCACCTACAACATCATAGTGGAGGCA
CTGAAAGACCAGCAGAGGCATAAGGTTCCGGAAAGAGGTTGTTACCGTGGGCAACTCTGTC
AACGAAGGCTTGAACCAACCTACCGATCCTCGTGCTTTGACCCCTACACAGTTTCCCAT
ATGCCGTTGGAGATGAGTGGGAACGAATGCTGTAATCAGGCTTTAAACTGTTGTGCCAGTG
CTTAGGCTTTGGAAGTGGTCATTTCAAGATGTGATTCATCTAGATGGTGCCATGACAATGG
TGTGAATAACAAGATTGGAGAGAAGTGGGACCGTCAGGGAGAAAATGGACCTGCCCGGG
CCGGCCGCTCGA

24_16480.edit

TCGAGCGNCGCCCGGGCAGGTCCAGTAGTGCCTTCGGGACTGGGTTCACCCCCAGGTCTG
CGGCAGTTGTACAGCGCCAGCCCCGCTGGCCTCCAAAGCATGTGCAGGAGCAAATGGCA
CCGAGATATTCCTTCTGCCACTGTTCTCCTACGTGGTATGTCTTCCCATCATCGTAACACGT
TGCCTCATGAGGGTCACACTTGAAATCTCCTTTTCCGTTCCCAAGACATGTGCAGCTCATTT
GGCTGGCTCTATAGTTTGGGGAAAGTTTGTGAAACTGTGCCACTGACCTTTACTTCCTCCT
TCTCTACTGGAGCTTTTCGTACCTTCCACTTCTGCTGTTGGTAAAATGGTGGATCTTCTATCA
ATTTCAATTGACAGTACCCACTTCTCCCAAACATCCAGGGAAAATAGTGATTTGAGAGCGATT
AGGAGAACCAAATTATGGGGCAGAAATAAGGGGCTTTTCCACAGGTTTTCTTTGGAGGA
AGATTTCAAGTGGTGACTTTAAAAGAATACTCAACAGTGTCTTCATCCCCATAGCAAAAGAA
GAAACNGTAAATGATGGAANGCTTCTGGAGATGCCNNCATTTAAGGGACNCCCAGAACTT
CACCATCTACAGGACCTACTTCAGTTTACANNAAGNCACATANTCTGACTCANAAAGGAC
CCAAGTAGCNCCATGGNCAGCACTTTNAGCCTTTCCCTGGGGAAAANNTTACNTTCTTAA
ANCCTNGGCCNNGACCCCTTAAGNCCAAATTNTGGAAAANTTCCNTNCNNCTGGGGGGC
NGTTCNACATGCNTTTNAAGGGCCCAATTNCCCCNT

25_16481.edit

TCGAGCGGCCCGCCCGGGCAGGTGTGGAGTCCAGCACGGGAGGCGTGGTCTTGTAGTTGT
TCTCCGGCTGCCCCATTGCTCTCCACTCCACGGCGATGTGCTGGGATAGAAGCCTTTGAC
CAGGCAGGTACGGCTGACCTGGTTCTGGTCACTCCTCCCGGATGGGGGCAGGGTGTAC
ACCTGTGGTTCTCGGGGCTCCCTTTGGCTTTGGAGATGGTTTTCTCGATGGGGCTGGGA
GGGCTTTGTTGGAGACCTTCCACTTGTACTCCTTGCCATTAGCCAGTCCTGGTGACAGGAC
GGTGAGGACGCTGACCACACGGTACGTGCTGTTGTACTGCTCCTCCCGCGGCTTTGTCTTG
GCATTATGCACCTCCACGCGGTCCACGTACCAGTTGAACTTGACCTCAGGGTCTTCGTGGC
TCACGTCCACCACCACGCAATGTAACCTCAGACCTCGGCCCGGACCACGCT

26_16481.edit

AGCGTGGTCCGGGCCGAGGTCTGAGGTTACATCCGTGGTGGTGGACGTGAGCCACGAAGA
CCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAA
GCCCCGGGAGGAGCAGTACAACAGCACGTACCGTGTGCTACCGTCTCACCCTCCTGCA
CCAGGACTGGCTGAATGCCAAGGAGTACAAGTCCAAGGTCTCCAACAAGCCCTCCACG
CCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAAGCCCCGAGAACCACAGGTGTACA
CCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTACGCTGACCTGCCTGGTCA
AAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCCGAGAAC
ACTACAAGACCACGCTCCCGTGTGACTCCGACACCTGCCCGGGCGGGCGCTCGA

27_16482.edit

TCGAGCGGCCCGCCCGGGCAGGTGAAATGGCTCCTCGCTGACCACCCCGGTGCTGGTGGTGG
GTACAGAGCTCCGATGGGTGAAACCATTCACATAGAGACTGTCCCTGTCCAGGGTGTAGG
GGCCAGCTCAGTGATGCCCTCGGTACGCTGGCTCAGCTTCCAGTACAGCCGCTCTCTGTC
CAGTCCAGGGCTTTTGGGCTCAGGACGATGGGTGCAGACAGCATCCACTCTGGTGGCTGC
CCCATCCTTCTCAGGCCTGAGCAAGGTCACTCTCCAACCAGAGTACAGAGAGCTGACACT
GGTGTCTTGAACAAGGGCATAAGCAGACCTGAAGGACACCTCGGCCGCGACCACGCT

FIG. 15JJ

170

23_16482.edit

AGCGTGGTCGCGGCCGAGGTGTCCTTCAGGGTCTGCTTATGCCCTTGTTCAAGAACACCAG
TGTCAGCTCTCTGTACTCTGGTTGCAGACTGACCTTGCTCAGGCCTGAGAAGGATGGGGCA
GCCACCAGAGTGGATGCTGTCTGCACCCATCGTCTGACCCCAAAGCCCTGGACTGGACA
GAGAGCGGCTGTACTGGAAGCTGAGCCAGCTGACCCACGGCATCACTGAGCTGGGCCCCCT
ACACCCTGGACAGGGACAGTCTCTATGTCAATGGTTTCACCCATCGGAGCTCTGTACCCAC
CACCAGCACCGGGGTGGTCAGCGAGGAGCCATTCAACTGCCCGGGCGGCCGCTCGA

29_16483.edit

AGCGTGGTCGCGGCCGAGGTCTGTGAGAGTGGCACTGGTAGAAGTTCCAGGAACCCTGA
ACTGTAAGGGTTCTTCATCAGTGCCAAACAGGATGACATGAAATGATGTACTCAGAAGTGTC
CTGGAATGGGGCCCATGAGATGGTTGTCTGAGAGAGAGCTTCTTGTCCTACATTGGCGGGG
TATGGTCTTGGCCTATGCCCTTATGGGGGTG⁵CCGTTGTGGGCGGTGTGGTCCGCCTAAAAC
CATGTTCTCTCAAAGATCATTTGTTGCCAAACACTGGGTTGCTGACCAGAAAGTGCCAGGAAG
CTGAATACCATTTCAGTGTCATACCCAGGGTGGGTGACGAAAGGGGTCTTTTGAAGTGTG
GAAGGAACATCCAAGATCTCTGGTCCATGAAGATTGGGGTGTGGAAGGGTTACCAGTTGG
GGAAGCTCGTCTGTCTTTTCTTCCAAATCAGGGGCTCGCTCTTCTGATTATTCTTCAGGGC
AATGACATAAAATTGTATATTCCGGTCCCGGTTCAGGCCAGTAATAGTAGCCTCTGTGACAC
CAGGGCGGGGCGGAGGGACCCCTTCTNTTGGAAAGAGACCAGCTTCTCATACTTGATGATGA
GNCCGGTAATCCTGGCACGTGCGNGGTTCATGATNCCACCAAGGAAATNGGNGGGGGNG
GACCTGCCCGGGCGGGCGGTTTCNAAAGCCCAATTCCACACACTTGGNGGCCGTACTATGGATC
CCACTCNGTCCAACCTTGGNGGAATATGCCATAACTTTT

31_16484.edit

TCGAGCGGCCGCGCGGCCAGGTCTCTGACCTTTTCACCAAGTGGGAACGTGTAATCCGTCT
CCACAGACAAGGCCAGGACTCGTTTGTACCGGTTGATGATAGAATGGGGTACTGATGCAA
CAGTTGGGTAGCCAAATCTGCAGACAGACACTGGCAACATTGGCGACACCCTCCAGGAAGC
GAGAATGCAGAGTTTCTCTGTGATATCAAGCACTTCAGGGTTGTAGATGCTGCCATTGTC
GAACACCTGCTGGATGACCAGCCCAAAGGAGAAGGGGGAGATGTTGAGCATGTTACGCAG
CGTGGCTTCGCTGGCTGCCACTTGTCTCCAGTCTTGATCAGACCTCGGCGCGGACCACGCT

37_16487.edit

AGCGTGGTCGCGGCCGAGGTCTGTCTACAGTCTCAGGACTCTACTCCCTCAGCAGCGTG
GTGACCGTGCCCTCCAGCAACTTCGGCACCCAGACCTACACCTGCAACGTAGATCAACAAGC
CCAGCAACACCAAGCTGGACAAGAGAGTTGAGCCCAAATCTTGTGACAAAACCTCACACAT
GCCCACCGTGCCCAAGCACCTCAACTCTGGGGGGACCGTCAGTCTTCTCTCCCCCGCAT
CCCCCTTCCAAACCTGCCCGGGGGGGGCTCG

FIG. 15KK

000T80" T089E950

M1

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CGAGCGGCCCGCCCGGGCAGGTTTGGAAGGGGGATGCGGGGGAAGAGGAAGACTGACGGT
CCCCCAGGAGTTCAGGTGCTGGGCACGGTGGGCATGTGTGAGTTTTGTCACAAGATTGG
GCTCAACTCTCTTGTCCACCTTGGTGTGGTGGCTTGTGATCTACGTTGCAGGTGTAGGTC
TGGGTGCCGAAGTTGCTGGAGGGCAGGTCACCACGCTGCTGAGGGAGTAGAGTCCTGAG
GACTGTAGGACAGACCTCGGCCGCGACCACGCT

39_16488.edit

NGGNNGGTCCGGNCNGNCAGGACCACTCNTCTTCGAAATA

41_16489.edit

AGCGTGGTCCGGCCGAGGTCTCACTTGCTCTGCAAAGCACCGATAGCTGCGCTCTGG
AAGCGCAGATCTGTTTTAAAGTCTGAGCAATTTCTCGCACCAGACGCTGGAAGGGAAGTT
TGCGAATCAGAAGTTCAGTGGACTTCTGATAACGTCTAATTTACGGAGCGCCACAGTACC
AGGACCTGCCCCGGCGGGCGCTCGA

42_16489.edit

TCGACCGGCCCGCCCGGGCAGGTCTCTGCTACTGNGGCGCTCCGTGAAATTAGACGTTATCA
GAAGTCCACTGAACCTTCTGATTCGCAAACCTTCCTTCCAGCGTCTGGTGCGAGAAATTGCT
CAGGACTTTAAACAGATCTGCGCTTCCAGAGCGCAGCTATCGGTGCTTTGCAGGACGCA
AGTGAGGACCTCGGCCCGCGACCACGCT

45_16491.edit

TCGACCGGCCCGCCCGGGCAGGTCCACATCGGCAGGGTCGGAGCCCTGGCCGCCATACTCG
AACTGGAATCCATCGGTCACTCTCTCGCCGAACCAAGACATGCCTCTTGTCTTGGGGTTCT
TGCTGATGTACCAAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACC
AGTCTCCATGTTCCAGAAGACTTTCATGCCATCCAGGTTGCAGCCTTGGTTGGGGTCAATC
CAGTACTCTCCACTCTTCCAGTCAGAGTGGCACATCTTGAGGTACGGCAGGTGCGGGCGG
GGTTCTTGACCTCGGCCCGCGACCACGCT

FIG. 15LL

MA

46_16491.edit

GTGGGNTTGAACCCNTTINANCTCCGCTTGGTACCGAGCTCGGATCCACTAGTAACGGCCG
CCAGTGTGCTGGAATTCGGCTTAGCGTGGTCCGGCCGAGGTCAAGAACCCCGCCGAC
CTGCCGTGACCTCAAGATGTGCCACTCTGACTGGAAGAGTGGAGAGTACTGGATTGACCC
CAACCAAGGCTGCAACCTGGATGCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGAC
CTGCGTGTACCCCACTCAGCCCACTGTGGCCGAGAGCAATGACCGATGGATTCCAGTTCGAGTA
CAAAGACAAGAGGCATGTCTGGTTCGGCCGAGAGCATGACCGATGGATTCCAGTTCGAGTA
TGGCGGCCAGGGCTCCGACCTGCCGATGTGGACCTGCCCGGGCGGCCGCTCGA

47_16492.edit

AGCGTGGTCCGGCCGAGGTCTGGGATGCTCCTGCTGTACAGTGAGATATTACAGGATC
ACTTACGGAGAAACAGGAGGAAATAGCCCTGTCCAGGAGTTCACTGTGCCTGGGAGCAAG
TCTACAGCTACCATCAGCGGCTTAAACCTGGAGTTGATTATACCATCACTGTGTATGCTG
TCACTGGCCGTGGAGACAGCCCCGCAAGCAGCAAGCCAAATTTCCATTAATTACCGAAGAG
AAATTGACAAACCATCCAGATGCAAGTGACCGATGTTTACGGACAACAGCATTAGTGCA
AGTGGCTGCCTTCAAGTTCCTCTGTTACTGGTTACAGAGTAACCACCACTCCCAAAAATGG
ACCAGGACCAACAAAACTAAACTGCAGGTCCAGATCAAACAGAAATGACTATTGAAG
GCTTGCAGCCCACTGGAGTATGTGGTTAAGTGTCTATGCTCAGAATCCAAGCGGAGAG
AAGTCAGCCTCTGGTTCAGACTGNAAGTAACCAACATTGATCGCCTAAAGGACTGGCATTG
ACTGATGNCGATGCCGATTCATCAAAATTCNTTGGGAAAACCCACAGGGGCAAGTTTNC
ANGTCNAGGNGGACCTACTGACCCCTCAGGATGGAATCCTTGACTNTTCTTNNCCTGAT
GGGGAACCAAACTTNAAACTTGAAGGACCTGCCCGGGCGGCCGTNCAAAACCCAATT
CCACCCCTTGGGGCGCTTCTATGGGNCCTACTCGGACCAAACTTGGGGTAAN

48_16492.edit

TCGAGCGCCCGCCCGGGCAGGTCTTCCAGGTCTCCAGTGTCTTCTTCAACATCAGGTGCA
GGGAATACCTCATGGATTCCATCTCAGGGCTCAGTAGGTACCCCTGTACCTGGAACCTT
GCCCCTGTGGGCTTTCCCAAGCAATTTTGAATCGGCATCCACATCAGTGAATGCCAG
TCCTTTAGGGCGATCAATGTTGGTTACTGCACTCTGAACCAAGGCTGACTCTCTCCGCTT
GGATTCTGACCATACACACTAACCACATACTCCACTGTGGCTGCAAGCCTTCAATAGTCA
TTTCTGTTTGATCTCGACCTCCAGTTTACTTTTGTGGTCTGCTGCAATTTTGGGAGTG
GTGGTACTCTGTAACCAAGTAACAGGGCAACTTGAAGGCACCCACTTGACACTAATGCTGT
TGCTCTGAACATCGGTCACTTCCATCTCGGATGGTTTGTCAATTTCTGTTCCGTAATTAATG
GAAATTGGCTTGGTGGCTTCCGGGGCTTGTCTCCACGGCCAGTGACAGCATAACACAGTGATG
GTATAATCAACTCCAGGTTTAAGCCGCTGATGGTAGCTGAACTTTGCTCCAGGCACAAGT
GAACCTCTGACAGGCTATTTCCTTCTGTTCTCCGTAAGTGATCTGTAAATATCTCACTGGG
ACAGCAGGANGCAATCCAAACTTCGGCCGNGACCCCTAAGCCGAATTNTGCAATATNC
ATCACTAGGCGGGCGCTCCANCAATCAATAAAGGCCCAATCNCCTATAGGGAGTNT
ANTACAATTNG

FIG. 15MM

000180" T089E950

Figure 1 consists of 12 histograms arranged in a single row. Each histogram represents the frequency distribution of the number of non-zero elements in the vector x for a specific value of n . The x-axis for all histograms is 'Number of non-zero elements in x ' with major ticks at 0, 20, 40, 60, 80, 100, and 120. The y-axis is 'Frequency' with major ticks at 0, 2, 4, 6, 8, and 10. The histograms are labeled with n values: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, and 120. For $n=10$, the distribution is centered around 60. As n increases, the distribution shifts to the right, indicating a higher number of non-zero elements, and the peak frequency decreases.

55_16496.edit

56_16496.edit

59_16498.edit

TCGAGCGGCCGCCCGCCGGGACGCTCCACCATAAAGTCCTGATACAACCACGGATGAGCTGTCA
GGACCAAGGTTGATTCTCTTCACTGGTCCGCTCTTCTCCTTGGGGGTCACCCCGACTCGATA
TCCAGTGAGCTGAACATTGGGTGCTGCCACTGGCGCTCAGGCTTGTGGGTGTGACCTGA
GTGAACTTCAGGTCAGTTGGTGCAGGAATAGTGGTACTGCCAGTCTGAACCAGAGGGCTGA
CTCTCTCCGCTTGGATTCTGAGCATAGACATAACCATACTCCACTGTGGGCTGCAAGC
CTTCAATAGTCATTTCTGTTTGATCTGGACCTGCAGTTTAGTTTTGTTGGTCTGGTCCAT
TTTTGGGAGTGGTGGTACTCTGTAACCAAGTAACAGGGGAACTTGAAGGCAGCCACTTGAC
ACTAATGCTGTTGTCTGTAACA TCGGTCACTTGCATCTGGGATGGTTTGNCAATTTCTGTT
GGTAATTAATGGAATTCGGCTTGGTCTTGGGGGCTGTCTCCACCGCCAGTGCACGCATA
CACAGNGATGCNATNATCAACTCCAAGTTAAAGGCCCTGATGGTAACTTTAAACTTGCTCC
CAGCCAGNGAACTTCCGGACAGGGTATTTCTTCTGGTTTTCCGAAAGNGANCTTGGAAATN
TCTCCTTGGANCAAGGANCNTCCAAAACCTTGGGCCGGAACCCCTT

FIG. 15VV

nd

60_16473.edit

AGCGTGGTCGCGGCCGAGGTCTGTGTCAGAGTGGCACTGGTAGAAGTTCCAGGAACCCCTGA
ACTGTAAGGGTTCTTCATCAGTGCCAACAGGATGACATGAAATGATGTACTCAGAAGTGTC
CTGGAATGGGGCCCCATGAGATGGTTGTCTGAGAGAGAGCTTCTTGTCTACATTCCGGCGGG
TATGGTCTTGGCCTATGCCCTTATGGGGGTGGCCGTTGTGGGCGGTGTGGTCCGCCTAAAAAC
CATGTTCTCTCAAAGATCAATTTGTTGCCAACACTGGGTTGCTGACCAGAAGTGCCAGGAAG
CTGAATACCATTTCAGTGTCATACCCAGGGTGGGTGACGAAAGGGGTCTTTTGAACGTGTG
GAAGGAACATCCAAGATCTCTGGTCCATGAAGATTGGGGTGTGGAAGGGTTACCAGTTGG
GGAAGCTCGTCTGTCTTTTTCCTTCCAATCAGGGGCTCGCTCTTCTGATTATTCTTCAGGGC
AATGACATAAAATTGTATATTCCGGTTCCCGGTTCCAGGCCAGTAATAGTAGCCTCTTGTGAC
ACCAGGGCGGGGCCANGGACCATTCTCTGGGANGAGACCCAGCTTCTCATACTTGATGAT
GTAACCCGGTAATCTGACGTGGCGGCTGNCATGATACCANCAAGGAATTGGGTGNGGN
GGACCTGCCCCGGCGGCCCTCNA

60_16498.edit

AGCGTGGTCGCGGCCGAGGTCTGGGATGCTCTGCTGTACAGTGAGATATTACAGGATC
ACTTACGGAGAAACAGGAGGAAATAGCCCTGTCCAGGAGTTCACTGTGCCTGGGAGCAAG
TCTACAGTACCATCAGCGGCCTTAAACCTGGAGTTGATTATACCATCACTGTGTATGCTG
TCACTGGCCGTGGAGACAGCCCCGCAAGCAGCAAGCCAATTTCCATTAAATTACCGAACAG
AAATTGACAAACCATCCCAGATGCAAGTGACCGATGTTCAAGGACAACAGCAATTAGTGTC
AGTGGCTGCCCTCAAGTTCCCTGTACTGCTTACAGAGTAACCACCACTCCCAAAAAATGG
ACCAGGACCAACAAAACTAAAACTGCAGGTCCAGATCAAACAGAAATGACTATTGAAG
GCTTGCAGCCACAGTGGAGTATGTCCTTAGTGTCTATGCTCAGAAATCCAAGCGGAGAGA
GTCACCTCTGCTTCACTGCACTAACCACTATTCTGCACCAACTGACCTGAAGTTCAC
TCAGGTCAACCCACAAGCTTGAGCCGCGCAGTGGACACCACCAATGTTCACTCACTGGAT
ATCGAGTGGGGTGACCCCCAAGGAGAGACCCCGACCCATGAAAGAAATCAACCTTGCT
CCTGACAGCTCATCCCGGGGTGTATGAGGACTTATCGGGGACTGCCCCGGCGGCGGNTC
GAAANCGAATTNTGAAATTTCTTCTCAGTGGGNGGCGNTTCGAGCTTCTTNTANANGGC
CCAATTCTCCTNTACNGGCTCGTN

61_16499.edit

AGCGTGGTCGCGGCCGAGGTCTNACGA

62_16483.edit

TCGAGCGGCGCGCCCGGCGCAGGTCCACCACACCCAAATTCCTTGCTGGTATCATGGCAGCCGC
CACGTGCCAGGATTACCGGCTACATCATCAAGTATGAGAAGCCTGGGTCTCTCCAGAGA
AGTGGTCCCTCGGCCCCCGCCCTGGTGTACAGAGGCTACTATTACTGGCTGGAACCGGGA
ACCGAATATACAATTTATGTCATTGCCCTGAAGAATAATCAGAAGAGCGAGCCCCCTGATTG
GAAGGAAAAACACAGACGAGCTTCCCCAACTGGTAACCTTCCACACCCCAATCTTCATG
GACCAGAGATCTTGGATGTTCTCTCCACAGTTCAAAAAGACCCCTTTCGTACCCACCCCTGG
GTATGACACTGGAAATGGTATTCAGCTTCTGCGCACTTCTGGTACGCAACCCAGTGTGGG
CAACAAATGATCTTTGAGGAACATGGTTTATGGCGGACCAACCCGCCACAAACGGGACCC
CCCAATAAGGNATAGGCCAAGACCATACCCCGCCGAATGTAGGACAAGAAGCTCTNTCTCA
ACAACCATCTCATGGGCCCCATTCAGGACACTTCTGAGTACATCATTTTCATGTCATCTG
GTGGCCACTTGATGAANAACCTTACAGTTCAGGTTCTGGAACCTTCTACCAGNGCCACT
TCTGACAGGANCTTGGCGGNGACCCCT

FIG. 1500

63_16500.edit

AGCGTGGTCGCGGCCGAGGTCCATTTCTCCCTGACGGTCCCACTTCTCTCCAATCTTG TAG
TTCACACCATTGT CATGGCACCATCTAGATGAATCACATCTGAAATGACCACTTCCAAAGC
CTAAGCACTGGCACAACAGTTTAAAGCCTGATTCAGACATTCGTTCCCACTCATCTCCAAC
GGCATAATGGGAAACTGTGTAGGGGTCAAAGCACGAGTCATCCGTAGGTTGGTTCAAGCC
TTCGTTGACAGAGTTGCCCACGGTAACAACCTCTTCCCGAACCTTATGCCTCTGCTGGTCTT
TCAGTGCCTCCACTATGATGTTGTAGGTGGCACCTCTGGTGAGGACCTGCCCCGGGCGGCC
GCTCGA

64_16493.edit

AGCGTGGTCGCGGCCGAGGTGTGCCCCAGACCAGGAATTCGGCTTCGACGTTGGCCCTGTC
TGCTTCCTGTAAACTCCCTCCATCCCAACCTGGCTCCCTCCACCCAACCAACTTTCCCCC
AACCCGGAACAGACAAGCAACCCAACTGAACCCCTCAAAAGCCAAAAAATGGGAG
ACAATTCACATGGACTTTGGAAAAATATTTTTTCTTTGCATTCTCTCAAACCTTAGTT
TTTATCTTTGACCAACCGAACATGACCAAAAAACCAAAAGTGACCTGCCCCGGGCGGCCGCTC
GA

64_16500.edit

TCGAGCCGCGCCCGGGCAGGTCTCACCAGAGGTGCCACCTACAACATCATAGTGGAGG
CACTGAAAGACCAGCAGAGGCATAAGCTTCGGGAAGAGGTTGTTACCGTGGGCAACTCTG
TCAACGAAGGCTTGAACCAACCTACGATGACTCGTGCTTTGACCCCTACACAGTTTCCCA
TTATGCCGTTGGAGATGAGTGGGAACGAATGTCTGAATCAGGCTTTAAACTGTTGTGCCAG
TGCTTAGGCTTTGGAAGTGCTCATTTGAGATGTGATTCTAGATGGTGCCATGACAATG
GTGTGAACCTACAAGATTGGAGAGAAGTGGGACCGTCAGGGAGAAAAATGGACCTCGGCCG
CGACCACGCT

FIG. 15PP

16501.edit

TCGAGCGGGCCCGGGCAGGTACCGGGTGGTCAGCGAGGAGCCATTCACACTGAACTT
CACCATCAACAACCTGCGGTATGAGGAGAACATGCAGCACCTGGCTCCAGGAAGTTCAA
CACCACGGAGAGGGTCCTTCAGGGCCTGCTCAGGTCCCTGTTCAAGAGCACCAGTGTGGC
CCTCTGACTCTGGCTGCAGACTGACTTTGCTCAGACCTGAGAAACATGGGGCAGCCACTG
GAGTGGACGCCATCTGCACCCTCCGCCTTGATCCCACTGGTCTGGACTGGACANANAGCG
GCTATACTTGGGAGCTGANCCNAACCTTTGGCGNGACNCCNCTT

16501.2.edit

GAGGACTGGCTCAGCTCCCAGTATAGCCGCTCTCTGTCCAGTCCAGGACCAGTGGGATCAA
GGCGGAGGGTGCAGATGGCGTCCACTCCAGTGGCTGCCCATGTTTCTCAAGTCTGAGCAA
AGNCAGTCTGCAGCCAGAGTACAGAGGGCCAACACTGGTGTCTTGAACAGGGACCTGAG
CAGGCCCTGAAGGACCTCTCCGTGGTGTGAACTTCTGGAGCCAGGGTGTGCATGTTT
TCCTCATACCGCAGGTTGTTGATGGTGAAGTTCAGTGTGAATGGCTCCTCGCTGACCACCC

16502.1.edit

AGCGTGGTGGCGGGCGAGGTCCACCACACCCAATTCCTTGGTGGTATCATGGCAGCCGCCA
CGTGCCAGGATTACCGGCTACATCAACAAGTATGAGAAGCCTGGGTCTCCTCCCAGAGAA
GTGGTCCCTCGGCCCCCGCCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGGAA
CCGAATATACAATTTATGTCAATGCCCTGAAGAATAATCAGAAGAGCGAGCCCTGATTGG
AAGGAAAAAGACAGACGAGCTTCCCCAACTGGTAACCCCTCCACACCCCAATCTTCATGG
ACCANANANCTTGGATNGTCTTCACTGGTTNAAAAAACCTTTTCGCCCCCCCACCTTG
GGGATTAACCTTGGGAAANGGGGAATTNACCNCTTC

16502.2.edit

TCGAGCGGGCCCGGGCAGGTCTCTGTACAGTGGCACTGGTAGAAGTTCAGGAACCCT
GAACTGTAAGGGTTCTTCATCACTGCCAACAGGATGACATGAAATGATGTACTCAGAAGT
GTCTGGAATGGGGCCCATGAGATGGTGTCTGACAGAGAGCTTCTTGCTCTACATTCCGGC
GGGTATGGTCTTGGCCTATCCCTTATGGGGGTGGCCGTTGTGGGCGGTGTGGTCCGCCTAA
AACCATGTTCTCAAAGATCAATTTGTTGCCCAACACTGGGTGCTGACCAGAAGTGCCAGG
AAGCTGAATACCATTTCCAGTGTCAACCCAGGGNGGGTGACCAAAAGGGGGTCNTTTNGA
CCTGGNGAAAGGAACCATCCAAAANCTCTGNCCCATG

FIG. 15QQ

16503.1.edit

AGCGTGGNCGCGGCCGAGGTCTGAGGATGTAACTCTTCCCAGGGGAAGGCTGAAGTGCT
GACCATGGTGCTACTGGGTCTTCTGAGTCAGATATGTGACTGATGNGAACTGAAGTAGGT
ACTGTAGATGGTGAAGTCTGGGTGTCCCTAAATGCTGCATCTCCAGAGCCTTCCATCATT
CCGTTTCTTCTTTTCTATGGGATGAGACACTGTTGAGTATTCTCTAAAGTCACCACTGAAA
TCTTCTCCAAAGGAAAACCTGTGGAAAAGCCCTTATTCTGCCCCATAATTTGGTTCTCC
TAATCNCTCTGAAATCACTATTTCCCTGGAANGTTTGGGAAAAANNGGGCNACCTGNCAN
TGGAAANTGGATANAAAGATCCCACCATTTTACCCAACNAGCAGAAAGTGGGAANGGTAC
CGAAAAGCTCCAAGTAANAAAAAGGAGGGAAGTAAAGGTCAAGTGGGCACCAGTTTCAA
ACAAAACCTTTCCCCAACTATANAACCCA

16503.2.edit

AAGCGGCCGCCCCGGGCAGGNNCAGNAGTGCTTCCGGGACTGGGNTCACCCCCAGGTCTGC
GGCAGTTGTACAGCGCCAGCCCCGCTGGCCTCCAAAGCATGTGCAGGAGCAAATGGCAC
CGAGATATTCCTTCTGCCACTGTTCTCTACGTGGTATGTCTTCCCATCATCGTAACACGTT
GCCTCATGAGGGTCACACTTGAATTCCTTTTCCGTTCCCAAGACATGTGCAGCTCATTTG
GCTGGCTCTATAGTTTGGGAAAAGTTTGTGAAACTGTGCCACTGACCTTTACTTCTCTCTT
CTCTACTGGAGCTTTCCGTACCTTCCACTTCTGCTGNTGGNAAAAAGGGNGGAACNTCTTA
TCAATTTTCATTGGACAGTANCCCNCTTTCTNCCCAAAACATNCAAGGGAAAAATATTGATTN
CNAGAGCGGATTAAGGAACAACCCNAAATTATGGGGGCCAGAAATAAAGGGGGCTTTTCCA
CAGGTNTTTTCT

16504.1.edit

TCGACCGGCCGCCCCGGGCAGGTCTGCAGGCTATTGTAAGTGTCTGAGCACATATGAGAT
AACCTGGGCCAAGCTATGATGTTCCATACGTTAGGTGTATTAATGCACCTTTTGAAGTCCA
TCTCAGTGGATGACAGCCTTCTCACTGACACCAGAGATCTTCTCACTGTGCCAGTGGGCA
GGAGAAAGAGCATGCTGCCACTGGACCTCGGCCGCGACCACGCT

16504.2.edit

AGCGTGGTGGCGGCCGAGGTCCAGTCCAGCATGCTCTTTCTCTGCCCAGTGGCACAGTG
AGGAAGATCTCTGCTGTCACTGACAAGGCTGTCTCACTGAGATGGCAGTCAAAAGTGC
ATTTAATACACCTAACGTATCGAACAATCATAGCTTGGCCCAGGTTATCTCATATGTGCTCA
GAACACTTACAATAGCCTGCAGACCTGCCCGGGCGGCCGCTCGA

FIG. 15RR

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[illegible]

16505.2.edit

16506.1.editt

16506.2.edit

FIG. 15SS

HA

16507.1.edit

AGCGTGGTTCGCGGCCGAGGTCAAGAACCCCGCCCGCACCTGCCGTGACCTCAAGATGTGC
CACTCTGACTGGAAGAGTGGAGAGTACTGGATTGACCCCAACCAAGGCTGCAACCTGGAT
GCCATCAAAGTCTTCTGCAACATGGAGACTGGTGAGACCTGCCGTGTACCCCACTCAGCCCA
GTGTGGCCCAGAAGAACTGGTACATCAGCAAGAACCCCAAGGACAAGAGGCATGTCTGGT
TCGGCGAGAGCATGACCGATGGATTCCAGTTCGAGTATGGCGGCCAGGGCTCCGACCCTG
CCGATGTGGACCTGCCCGNCCCGNCCGCTCGAAAAGCCCAATTTCAGNCACACTTGG
CCGGCCGTTACTACTG

16507.2.edit

TCGAGCGGCGCCCGGGCAGGTCCACATCGGCAGGGTCCGAGCCCTGGCCGCCATACTCG
AACTGGAATCCATCGGTCTGCTCTCGCCGAACCAGACATGCCTCTTGTCTTGGGGTTCT
TGCTGATGTACCAAGTTCTTCTGGGCCACACGGGCTGAGTGGGGTACACGCAGGTCTCACC
AGTCTCCATGTTGCAGAAGACTTTGATGGCATCCAGGTTGCAGCCTTGGTTGGGGTCAATC
CAGTACTCTCCACTCTTCCAGTCAGAGTGGCACATCTTGAGGTACCGGCAGGTGCGGGCGG
GGTCTTGACCTCGGCCCGGACACGCT

16508.1.edit

CGAGCGGCGCCCGGGCAGGTCCCCCCCCCTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT
TT

16508.2.edit

AGCGTGGTCCCGGCCGAGGTCTGGCAATCCTTCGACTTCTCTCCAGCCGAGCTTCCCAGAA
CATCACATATCACTGCAAAAAATAGCAATGCATACATGGATCAGGCCAGTGGAATGTAAA
GAAGGCCCTGAAGCTGATGGCGTCAAATGAAGGTGAATCAAGGCTGAAGGAAATAGCA
AATTCACCTACACAGTTCTCGACGATGGTTGCACGAAACACACTGGGGAAATGGAGCAAAA
CAGTCTTTGAATATCCAACACGCAAGGCTGTGAGACTACCTATTGTAGATATTGCACCCTA
TGACATTGGTGGTCTGATCAAGAAATTTGGTGTGGACGTTGGCCCTGTTTGCTTTTATAAA
CCAAACTCTATCTGAAATCCCAACAAAAAAATTTAACTCCATAATGTGNTCCTCTTGTTCT
AATCTTGGCAACCAGTGCAAGTGACCGACAAAAATTCAGTTATTTATTTCCAAAATGTTTG
GAAACAGTATAATTTGACAAAGAAAAAAGGATACTTCTTTTTTTGGCTGGTCCACCAAA
TACAATTCAAAAGGCTTTTTGGTTTTATTTTTTANCCAATTCCAATTTCAAAATGTCTCAA
TGGNGCTTATAATAAAATAAACTTTCACCCCTTTTTTTNTGAT

FIG. 15TT

[illegible]

16509.2.edit

16510.1.edir

16510.2edit

ACCGTGGTGGGGGGGAGGTCTGGGATGCTCTGCTGTCTCAGTGAGATATTACAGGATC
ACTTACGGAGAAACAGGAGGAAATAGCCCTGTCCAGGAGTTCACTGTGCCTGGGAGCAAG
TGTACAGCTACCATCAGCGGCTTAAACCTGGAGTTGATTATACCATCACTGTGTATGCTG
TCACTGGCGGTGGAGACAGCCCGGCAAGCAGTAAGCCAATTTCCATTAAATTACCGAACAG
AAATTGACAAAGCATCCAGATGCAAGTGACCGATGTTTCAGGACAACAGCATTAGTGTC
AGTGGCTGCCCTTCAAGTTCCCGCTGTTACTCGTTACAGAGTAACCACTCCCAAAAAATGG
GACCAGGACCAACAAAAAATAAACTGCANGGTCCAGATCAAAACAGAAATGACTATTG
AAGGCTTGACAGCCACAGTGGAGTATGTGGGTTAGTGTCTATGCTCAGAAATNCCAAGCGG
AGAGAGTCAGCCTCTGGTTCAGACT

FIG. 15UU

16511.1.edit

TCGAGCGGCCGCGCCGGGCAGGTACGCGCTCTCAGGACGTCACCACCATGGCCTGGGCTCT
GCTCCTCCTCACCCTCCTCACTCAGGGCACAGGGTCCCTGGGCCCAGTCTGCCCTGACTCAG
CCTCCCTCCGCGTCCGGGTCTCCTGGACAGTCAGTCACCATCTCCTGCACTGGAACCAGCA
GTGACGTTGGTGCTTATGAATTTGTCTCCTGGTACCAACAACACCCAGGCAAGGCCCCCAA
ACTCATGATTTCTGAGGTACTAAGCGGCCCTCAGGGGTCCCTGATCGCTTCTCTGGCTCC
AAGTCTGGCAACACGGCCTCCCTGACCGTCTCTGGGCTCCANGCTGAGGATGANGCTGATT
ATTACTGGAAGCTCATATGCAGGCAACAACAATTGGGTGTTCCGGCGGAAGGGACCAAGCT
GACCGTNTAAAGGTCAAGCCCAAGGCTTGCCCCCTCGGTCACTCTGTTCCCACCTCCTCT
GAAGAAGCTTTCAAGCCAACAANGNCACACTGGGTGTGTCTCATAAGTGGACTTTCTACCC

16511.2.edit

AGCGTGGTTCGCGGCCGAGGTCTGTAGCTTCTGTGGGACTTCCACTGCTCAGGCGTCAGGCT
CAGGTAGCTGCTGGCCGCTACTTGTGTTGCTTTGNITGGAGGGTGTGGTGGTCTCCACT
CCCGCCTTGACGGGGCTGCTATCTGCCCTCCAGGCCACTGTCAGGCTCCCGGTAGAAGT
CACTTATGAGACACACCAGTGTGGCCTTGTGGCTTGAAGCTCCTCAGAGGAGGGTGGGA
ACAGAGTGACCGAGGGGCCAGCCTTGGGCTGACCTAGGACGGTCAGCTTGGTCCCTCCGC
CGAACACCCAATTGTTGTGCTGCTATGAGCTGCAGTAATAATCAGCCTCATCCTCAGC
CTGGAGCCCAGAGACNGTCAAGGGAGGCCCGTGTGTTGCCAAGACTTGGAAAGCCAGANAAG
CGATCAGGGACCCCTGAGGGCCGCTTTACNGACCTCAAAAAATCATGAATTTGGGGGGCC
TTTGCTGGGNGTTGGTTGGTNACCAGNAAAAACAAAATTTTATAAAGCACCAACGTCCT
GCTGGTTTCCAGTGCANGAANATGGTGAACCTGAANTGTCC

16512.1.edit

AGCGTGGTTCGCGGCCGAGGTCCAGCATCAGGAGCCCCCGCTTCCCGGCTCTGGTCATCGCC
TTTCTTTTTGTGGCCTGAAACGATGTCAATTCGAGTAGCAGAACTGCCGTCTCCACTG
CTGTCTTATAAGTCTGCAGCTTCACAGCCAAATGGCTCCCATATGCCCAAGTTCCTTCATGTCC
ACCAAAGTACCCGTCTCACCAATTTACACCCAGGTCTCACAGTTCTCCTGGGTGTGCTTGG
CCCCAAGGGAGGTAAAGTANACGGATGCTGCTGCTCCACAGTTCTGGATCAGGGTACGAG
GAATGACCTCTAGGGCCTCGCCNACAAACCCCTGTATGGACCTGCCCGGGCGGGCCCCGCTC
GA

16512.2.edit

TCGAGCGGCCGCGCCGGGCAGGTCCATACAGGGCTGTTGCCCAAGGCCCTAGAGGNCATTCC
TTGTACCCTGATCCAGAAGTGTGGGACGAGCCATCCGTCTACTTACCTCCCTTCGGGCC
AAGCACACCCAGGAGAAGTCTCAGACCTGGCGGTGTAATGGNGAGACGGGTACTTTGGTG
GACATGAAGCAACTGGGCATATGGGAGCCATTGGCTGNGAACCTGCANACTTATAAGACA
GCAGTGGAGACGGCAGTTCTGCTACTGCCAATTGATGACATCGTTTCAGGCCACAAAAAG
AAAGGCGATGACCANACCCGCCAAGGGCGGGCTTCTGATGCTGGACCTCGGCCGCGGAC
CAAGCTT

FIG. 15VV

16514.1.edit

AGCGTGGTCCGGCCGAGGTCCACTAGAGGTCTGTGTGCCATTGCCAGGCAGAGTCTCTG
CGTTACAACTCCTAGGAGGGCTTGTGTGCGGAGGGCTGCTATGGTGTGCTGCGGTTC
TCATGGAGAGTGGGGCCAAAGGCTGCGAGGTGTGGTGTCTGGAACTCCGAGGACAGA
GGGCTAAATCCATGAAGTTTGTGGATGGCCTGATGATCCACAGCGGAGACCCTGTAACTA
CTACGTTGACACTGCTGTGCGCCACGTGTTGCTCANACAGGGTGTGCTGGGCATCAAGGTG
AAGATCATGCTGCCCTGGGACCCANCTGGCAAAAATGGCCCTTAAAAACCCCTTGCCNTG
ACCACGTGAACCAATTTGTGNGAACCCCAAGATGAANATACTTGCCACCACCCCCCATTC

16514.2.edit

TCGAGCGGGCCCGGGCCAGGTCTGCCAAGGAGACCCTGTTATGCTGTGGGGACTGGCTG
GGGCATGGCAGGCGGCTCTGGCTTCCCACCTTCTGTTCTGAGATGGGGGTGGTGGGCAGT
ATCTCATCTTTGGGTCCACAATGCTCAGTGGTCAGGCAGGGGCTTCTTAGGGCCAATCT
TACCAGTTGGGTCCCAGGGCAGCATGATCTTACCTTGATGCCACAGCACACCCTGTCTGAG
CAACACGTGGCGCACAGCAGTGTCAACGTAGTAAACAGGGTCTCCGCTGTGGATCAT
CAGGCCATCCACAACTTCATGGATTTAGCCCTCTGTCTCGGAGTTTCCAAAAACCCAC
AACCTCGCCAGCCTTTGGGCCCCACTTCTTCATGAATGAAACCGCAGCACACCAATTANCA
GGCCCTTCCGCACAGGNAAGCCCTTCTTAAGGAGTTTGTAAACGCAAAAAACTCTTGCTT
GGGGCAAAATGGGCACACAGACCTNTANTNGGACCTTGGNCCGCGAACCACCGCTT

16515.1.edit

AGCGTGGTCCGGCCGAGGTCTGCCCCCTCTGSCAAGGCTCGTGAAGATGGTCACCCTGG
AAAACCCGGACCACTGGTGAGAGAGGAGTTGTTGACACACAGGGTGTCTCGTGGTTTCCC
TGGAACTCCTGGACTTCTGCTTCAAAGGCATTAGGGGACACAATGGTCTGGATCGATTG
AAGGGACAGCCCCGGTCTCTGCTGTAAGGGTGAACCTGGNGCCCCCTGGTGAAAATGGA
ACTCCAGTCAAAACAGGAGCCCTGNGCCCTTCTGNGAGAGAGGACGTGTTGGTGGCCCT
GCCCCANACCTGCCCCGGGGCGGCTGNAAGGCGAAATCCAGNACACTGGCGGGCCGNT
ACTANTGGAATCCGAACCTTGGGTACCAAGCTTGGCCGTAATCATGGCCATAGCTTGTTC
CTGGGGNGGAAAATGGTATTCCGCTTCCAAATCCACACAACATACCGAACC CGGAAGCA
TTAAAGTGTAAAAGCCCTGGGGGGGCTAAATGANGTGAGCNTAACTCNCATTTAAATGG
CGTTGCGCTTCACTGCCCCGCTTTTCCAGTCCGGGNA

16515.2.edit

TCGAGCGGGCCCGGGCCAGGTCTGGGGCAGGGCCACCAACACGTCTCTCTCACCAGGA
AGCCCACGGGCTCTGTTTGACCTGGAGTTCCATTTTACCAGGGGCACCAGGTTACCCCT
TCACACCAGGAGCACCGGGCTGTCCCTTCAATCCATCCAGACCAATTGTGNGCCCTAATGCC
TTTGAAGCCAGCAAGTCCAGGAGTTCCAGCGAAACCAGGACCCCTGTGGTCCAACAAC
TCCTCTCTCACCAGGTCTGCGGCTTTTCCAGGGTACCATCTTACCAGCCTTGCCAGGA
GGGCCAGACCTCGCCCCCGGACCAACCT

FIG. 15WW

47

16516.1.edit

ANCGTGGTCGCGGCCGAGGTCTCACCAGAGGTGNCACCTACAACATCATAGTGGAGGCA
CTGAAAGACCANCAGAGGCATAAGGTTTCGGGAAGAGG

16516.2.edit

TCGAGCGGGCCCCGGGCAGGTCCATTTTCTCCCTGACGGTCCCACTTCTCTCCAATCTTGT
AGTTCACACCAATTGTCATGGCACCATCTAGATGAATCACATCTGAAATGACCACTTCCAAA
GCCTAAGCACTGGCACAACAGTTTAAAGCCTGATTGACATTCGTTCCCACTCATCTCCA
ACGGCATAATGGGAAACTGTGTAGGGGTCAAAGCAGAGTCATCCGTAGGTTGGTTCAAG
CCTTCGTTGACAGAGTTGTCCACGGTAACAACCTCTTCCCGAACCTTATGCCTCTGTGGTC
TTTCAGTGCCTCCACTATGATGTTGTAGGTGGCACCTCTGGTGAGGACCTCNGNCCNGAAC
AACGCTTAAGCCCGNATTCTGCAGAATAATCCCATCACACTTGGCGGCCGCTTCGANCATG
CATCNTAAAAGGGGGCCCCAATTTCCCCCTTATAAGNGAANCCGTATTTNCCAATTTCACTG
GNCCCCCGNTTTTACAAACGNCGGTGAAATGGGGAAAAACCCTGGCGGTTACCCAACTT
TAATCGCCNTTGGCAGCACAAATCCCCCTTTTCGNCCANCNTGGGCGTAAATAACCGAAAA

16517.1.edit

ANCGNGGTGCGCGGCCGANGTNTTTTTCTTNTTTTTT

16518.1.edit

AGCGTGGTCGCGGCCGAGGTCTCAGGTTACATGCGTGGTGGTGACGTGAGCCACGAAGA
CCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAA
GCCGCGGGAGGAGCACTACAACAGCACGTACCGGNGGTCAGCGTCCTCACCGTCCTGCA
CCAGAAATTGGTTGAATGGCAAGGAGTACAAGNGCAAGGTTTCCAAACAAAGCCNTCCCAGC
CCCCNTCGAAAAAACCAATTTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACAC
CCTGCCCCCATCCCGGGAGGAAAAGANCAANAACCNGGTTACGCCTTAACTTGCTTGGTC
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CGAAAAACAATTACAANAACCCC

16518.2.edit

TCGACCGGGCCCCGGGCAGGTGTCCGAGTCCAGCACGGGAGGCGTGGTCTTGTAGTTGT
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CAGGCAGGTACGGTGACCTGGTTCTTGGTCATCTCCTCCCGGATGGGGGCAGGGTGAA
CACCTGGGGTTCTCGGGGCTTCCCTTTGGTTTGAANATGTTTTCTCGATGGGGGCTGG
AAGGGCTTTGTTGNAACCTTCCACTTGACTCCTTGCCATTACCCAGNCCTGGNCCAGGA
CGNGAGGACNCTNACCACACGGAACCGGGCTGGTGGACTGCTCC

FIG. 15XX

16519.1.edit

AGCGTGGTCCGGGACGANGTCTGTGTCAGAGTGGNACTGGTAGAAGTTCCANGAACCCCTGA
ACTGTAAGGGTTCTTCATCAGTGCCAACAGGATGACATGAAATGATGTACTCAGAAGNGN
CCTGGAATGGGGCCCCATGANATGGTTGCC

16519.2.edit

TCGAGCGGGCCCCGGGCGAGGTCCACCACACCCAATTCCTTGCTGGTATCATGGCAGCCGC
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AGTGGTCCCTCGGGCCCCGCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGGA
ACCGAATATACAATTTATGTCAATTGCCCTGAAGAATAATCAGAAGAGCGAGCCCCCTGATTG
GAAGGAAAAAGACAGACGAGCTTCCCCAACTGGTAACCCCTTCCACACCCCAATCTTCATG
GACCAGAGATCTTGATGTTCTTCCACAGTTCAAAAGACCCCTTTCGGCACCCCCCTGG
GTATGAACCTGGGAAAAANGGNANTTAANCTTTCCTGGCA

16520.1.edit

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TCACTGGCCGTGGAGACACCCCGCAAGCAGCAAGCCAATTTCCATTAATTACCGAACAG
AAATTGACAAACCATCCCAGATGCAAGTGACCGATGTTCAAGGACAACAGCATTAGTGTC
AGTGGCTGCCTTCAAGGTNCCCTGGTACTCGGTTACAGANTAACCACCACTCCCAAAAAATG
GACCAGGAACCAAAAACTTAAACTGCAGGGTCCAGATCAAAACAGAAATGACTATTGA
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AAAANGTCAACCCCTTNTGGGTTCAA

16520.2.edit

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GCCCCGTGCGGCTTTCCCAAGCAATTTGATGGAAATCGACATCCACATCAGTGAATGCCAG
TCCTTAGGGCGATCAATGTTGGTACTCCAGNCTGAACCAGAGGGCTGACTCTCTCCGCTT
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ATTTCTGTTTGATCTGGACC

16521.2.edit

TCGAGCGGGCCCCGGGCGGAGGTCTGGTGGGCTCTGGCACACGCACATGGGGGNGTTGNT
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NAGCTTCGACTCTTCTGCCACTTCTTTGCCACAAAGTGCACCCTGGAGGGCACCAAGAAG
GGCCACAAGCTCCACCTGGACTACATCGGGCCTTGCAAATACATCCCCCTTGCCTGGACT
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TTGTATCANAGGGATGAAGACACNACCC

FIG. 15YY

000780" T09E950

419

16522.1.edit

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CCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCCCAAATCTTGTGACAAAACCTCACACAT
GCCCACCGTGCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCGCAT
CCCCCTTCCAAACCTGCCCGGGCGGCCGCTCGAAAAGCCGAATTCAGCACACTGGCGGCCG
GTACTAGTGGANCCNAACCTTGGNANCCAACCTGGNGGAANTAATGGGCATAANCTGTTTC
TGGGGGGAAATTGGTATCCNGTTTACAATTCCCNACACATACGAGCCGGAAGCATAAA
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CCGCTCACTGGCCCCGCTTTTCCAGC

16522.2.edit

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CTGGGNGCCGAAGTTGCTGGAGCGCACGGTCAACACGCTGCTGAGGGAGTAGAGTCTGA
GGACTGTANGACAGACCTCGGCCGNGACCAGCTAAGCCGAATTCTGCAGATATCCATCA
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16523.1.edit

AGCGTGGNCGCGGACGANGACAACAACCCC

16523.2.edit

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GCTGATGNACCAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTACCA
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16524.1.edit

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CCTGCTGGTTTCCCTGGTGCTCCTGGACAGAAATGGTGAACCTGGNGGTAAAGGAGAAAGA
GGGGCTCCGGNTGANAAAGGTGAACGAGGCCCTCCTGNATTGGCAGGGGCCCCANGACTT
AGAGGTGGAGCTGGCCCCCCTGGCCCCGAAGGAGGAAAGGTGCTGCTGGTCTCTCTGG
CCACCTGG

FIG. 15ZZ

Figure 1 consists of 12 histograms arranged in a single row. Each histogram represents the distribution of the number of non-zero elements in the vector x for a specific value of n , ranging from 10 to 120 in increments of 10. The x-axis for all histograms is labeled 'x' and ranges from 0 to 120. The y-axis is labeled 'count' and ranges from 0 to 100. The histograms show that as n increases, the distribution of x becomes more concentrated around zero, with the peak count increasing significantly.

16526.1.edit

16526.2.edit

16527.1.edjr

16527.2.edit

FIG. 15AAA

A

16523.1.edit

TCGAGCGGGCCCGCCGGCCAGGTCCACCACACCCAATTCCTTGCTGGTATCATGGCAGCCGC
CACGTGCCAGGATTACCGGCTACATCAAGTATGAGAAGCCTGGGTCTCTCCCAGAGA
AGTGGTCCCTCGGCCCCGCCCTGGTGTACAGAGGCTACTATTACTGGCCTGGAACCGGGA
ACCGAATATACAATTTATGTCAATTGCCCTGAAG

16523.2.edit

AGCGTGNTCNCGGCCGAGGATGGGGAAGCTCGNCTGTCTTTTCTTCCAATCAGGGGCTN
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GACCCAGGCTTCTCATACTTGATGATGAAGCCGTAATCCTGGCACGTGGGCGGCTGCCAT
GATACCACCAANGAATTGGGTGTGGTGGACCTGCCCGGGCGGGCGCTCGAAAANCCGAA
TTCNTGCAAGAATATCCATCACACTTGGGCGGGCCGNTCGAACCATGCATCNTAAAAGGG
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16529.1.edit

TCGAGCGGGCCCGCCGGCCAGGTCTCGCGGTCCGACTGGTGATGCTGGTCTGTGGTCCCC
CCGGCCCTCTGGACCTCTGGTCCCCCTGGTCTCCAGCGCTGGTTTCGACTTCAGCTTC
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GCCAATGTGGTTCGTGACCGTGACCTCGAGGTGGACACCACCTCAAGAGCCTTGAGCCA
GCAGAAATCGAAAACATTGGGAACCCAAGAAGGGCAAGCCCGCAAGAAACCCCGCCCCG
ACCTGGCCGNGAACCTCCAAGAANGTGCCACNTCTTGACTGGGAAAAAAGGGAAAANT
ACTTGAATTGGAC

16529.2.edit

AGCGTGGTCCGCGCCGAGGTCCACATCGGCAGGGTCCGAGCCCTGGCCGCCATACTCGAA
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TGATGTACCAGTTCTTCTGGGCCACACTGGGCTGAGTGGGGTACACGCAGGTCTCACCAGT
CTCCATGTTCCAGAAAGACTTTGATGCCATCCAGGTTGCAGCCTTGGTTGGGGTCAATCCAG
TACTCTCCACTCTTCCAGTCAGAACTGGCACATCTTGAGGTACGGCAGGGTGGGGCGGG
GTTCTTGGCGGCTGCCCTTCTGGGCTCCCGGAATGTTCTNNGAACTTGCTGG

FIG. 15BBB

[illegible]

2

16530.2.edit

16531.1.edit

16531.2.edit

16532.1.edic

11

Run	Time (min)	Temp (°C)	Pressure (mm Hg)	Flow Rate (ml/min)	Detector Response
1	10.0	100	1.0	0.5	0.1
2	20.0	100	1.0	0.5	0.2
3	30.0	100	1.0	0.5	0.3
4	40.0	100	1.0	0.5	0.4
5	50.0	100	1.0	0.5	0.5
6	60.0	100	1.0	0.5	0.6
7	70.0	100	1.0	0.5	0.7
8	80.0	100	1.0	0.5	0.8
9	90.0	100	1.0	0.5	0.9
10	100.0	100	1.0	0.5	1.0
11	110.0	100	1.0	0.5	1.1
12	120.0	100	1.0	0.5	1.2
13	130.0	100	1.0	0.5	1.3
14	140.0	100	1.0	0.5	1.4
15	150.0	100	1.0	0.5	1.5
16	160.0	100	1.0	0.5	1.6
17	170.0	100	1.0	0.5	1.7
18	180.0	100	1.0	0.5	1.8
19	190.0	100	1.0	0.5	1.9
20	200.0	100	1.0	0.5	2.0
21	210.0	100	1.0	0.5	2.1
22	220.0	100	1.0	0.5	2.2
23	230.0	100	1.0	0.5	2.3
24	240.0	100	1.0	0.5	2.4
25	250.0	100	1.0	0.5	2.5
26	260.0	100	1.0	0.5	2.6
27	270.0	100	1.0	0.5	2.7
28	280.0	100	1.0	0.5	2.8
29	290.0	100	1.0	0.5	2.9
30	300.0	100	1.0	0.5	3.0
31	310.0	100	1.0	0.5	3.1
32	320.0	100	1.0	0.5	3.2
33	330.0	100	1.0	0.5	3.3
34	340.0	100	1.0	0.5	3.4
35	350.0	100	1.0	0.5	3.5
36	360.0	100	1.0	0.5	3.6
37	370.0	100	1.0	0.5	3.7
38	380.0	100	1.0	0.5	3.8
39	390.0	100	1.0	0.5	3.9
40	400.0	100	1.0	0.5	4.0
41	410.0	100	1.0	0.5	4.1
42	420.0	100	1.0	0.5	4.2
43	430.0	100	1.0	0.5	4.3
44	440.0	100	1.0	0.5	4.4
45	450.0	100	1.0	0.5	4.5
46	460.0	100	1.0	0.5	4.6
47	470.0	100	1.0	0.5	4.7
48	480.0	100	1.0	0.5	4.8
49	490.0	100	1.0	0.5	4.9
50	500.0	100	1.0	0.5	5.0
51	510.0	100	1.0	0.5	5.1
52	520.0	100	1.0	0.5	5.2
53	530.0	100	1.0	0.5	5.3
54	540.0	100	1.0	0.5	5.4
55	550.0	100	1.0	0.5	5.5
56	560.0	100	1.0	0.5	5.6
57	570.0	100	1.0	0.5	5.7
58	580.0	100	1.0	0.5	5.8
59	590.0	100	1.0	0.5	5.9
60	600.0	100	1.0	0.5	6.0
61	610.0	100	1.0	0.5	6.1
62	620.0	100	1.0	0.5	6.2
63	630.0	100	1.0	0.5	6.3
64	640.0	100	1.0	0.5	6.4
65	650.0	100	1.0	0.5	6.5

02_16558.4.edit

03_16535.1.edit

04_16535.2.edit

05_16536.1.edir

FIG. 15DDD

00

07_16537.1.edit

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TCTCCATGTTGCAGAAGACTTTGATGGCATCCAGGTTGCAGCCTTGTTGGGGTCAATCCA
GTACTCTCCACTCTTCCAGTCAGAAGTGGGCACATCTTGAGGTCACCGGCAGGTGCCGGGC
CGGGGGTTCTTGGCGCTTGCCCTCTGGGCTCCGGATGTTCTCGATCTGCTTGGCTCAGGCTC
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GA

08_16537.2.edit

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CCGCACCTGCCGTGACCTCAAGATGTGCCACTCTGACTGGAAGAGTGGAGAGTACTGGAT
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GAGACCTGCGTGTACCCCACTCAGCCCACTGTGGGCCCAGAAGAACTGGTACATCAGCA
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ACCACCGCT

FIG. 15EE

000T80" T089E95D"

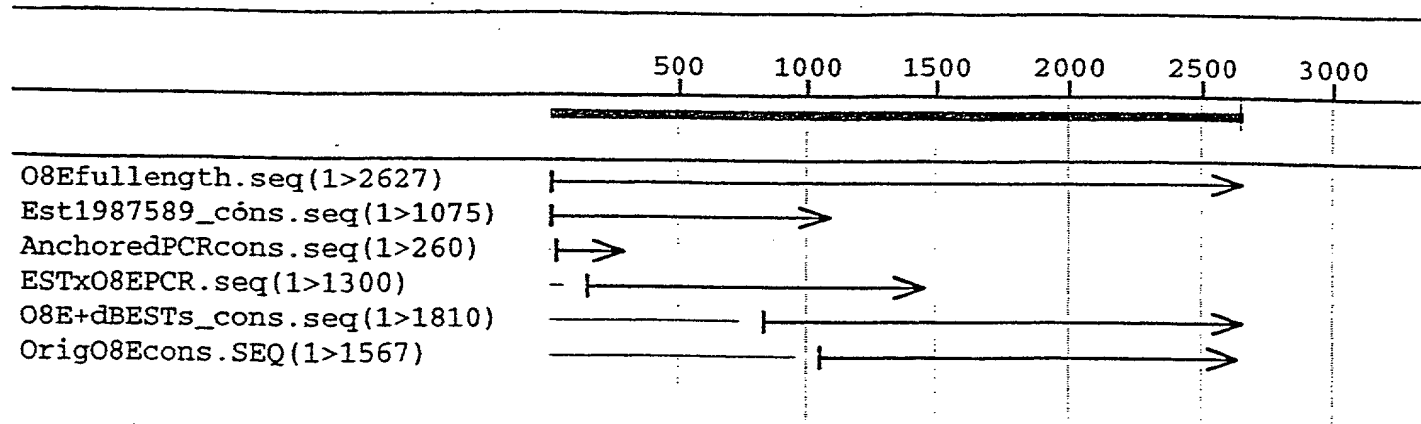


Fig. 16

AR

43

O8E Epitope Mapping

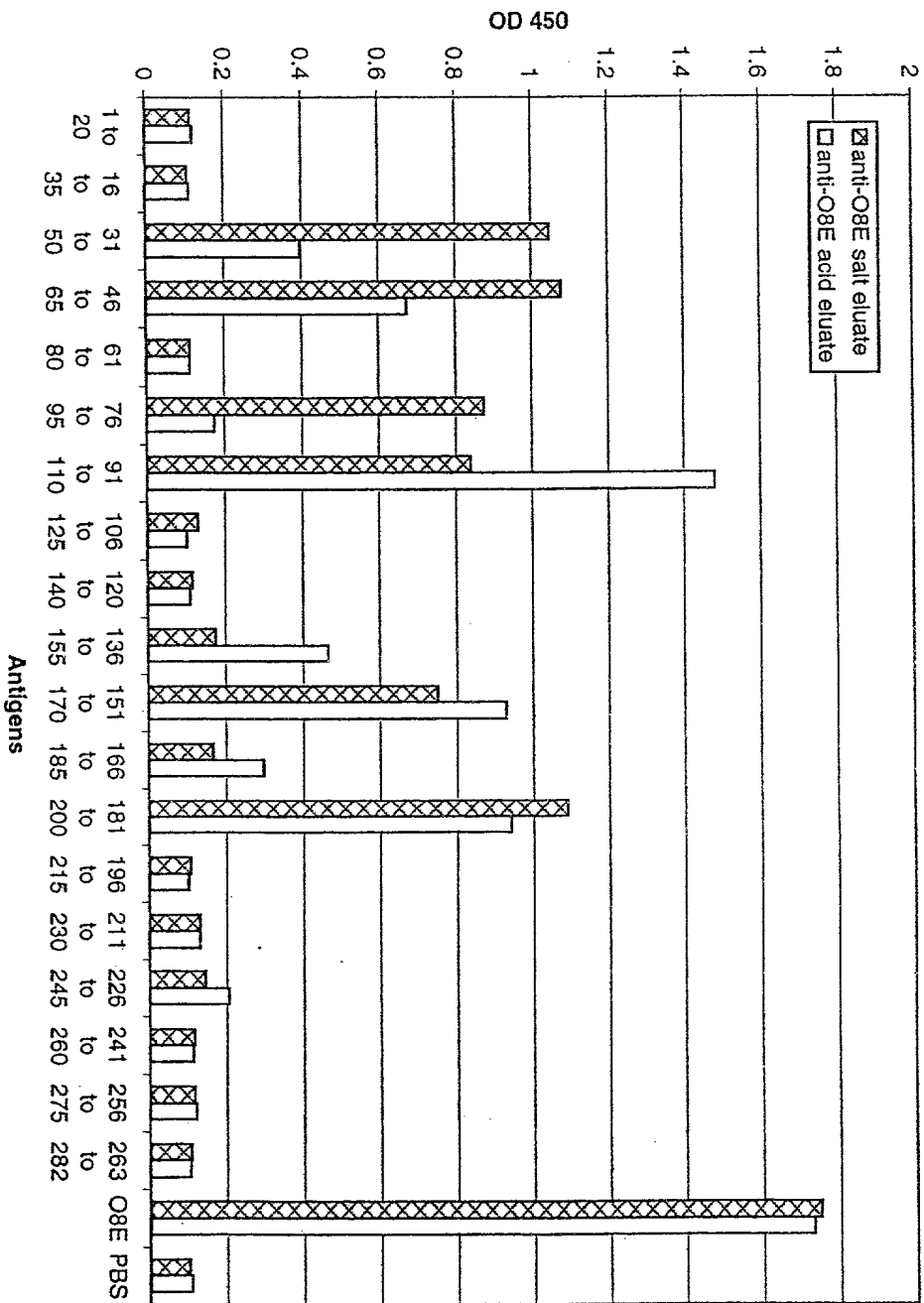
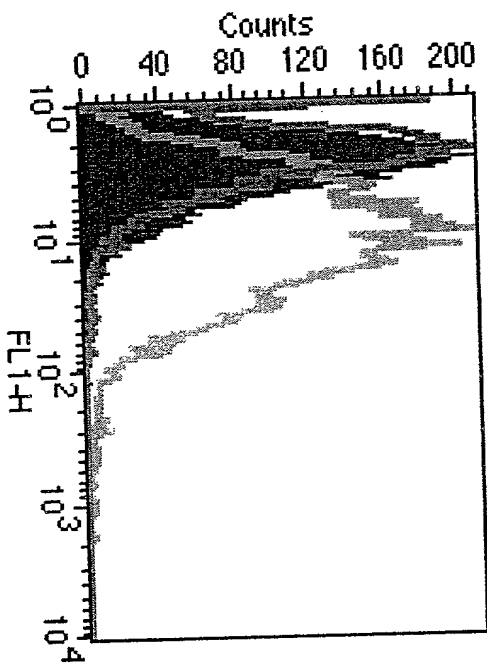


Fig. 17

09636301.001000

O8E Surface Expression

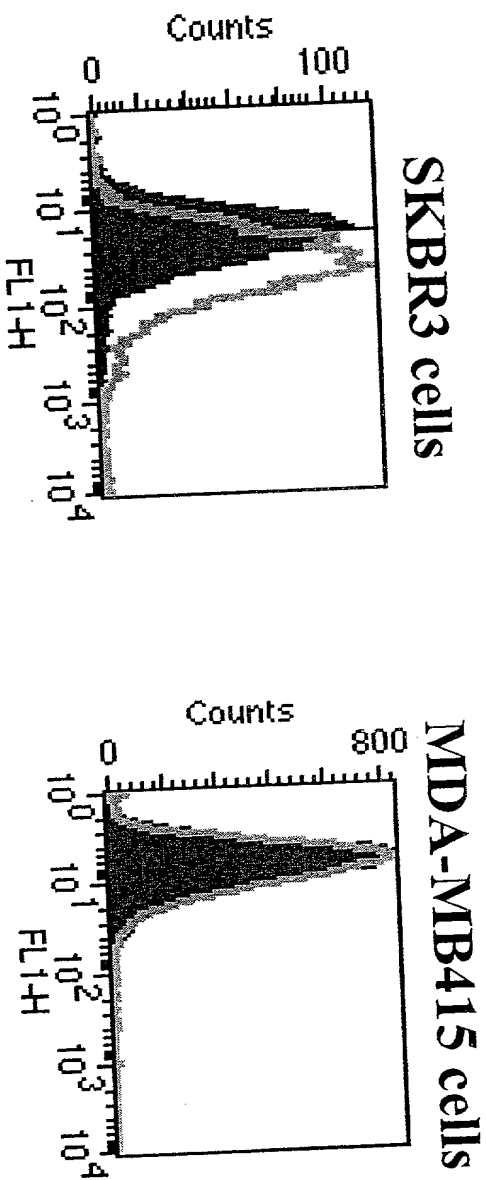
Fig. 18



- B305D/HEK stained with anti-O8E antibody
- ▨ O8E/HEK stained with anti-O8E antibody
- O8E/HEK stained with an irrelevant antibody

09535801.081000

Surface expression of O8E

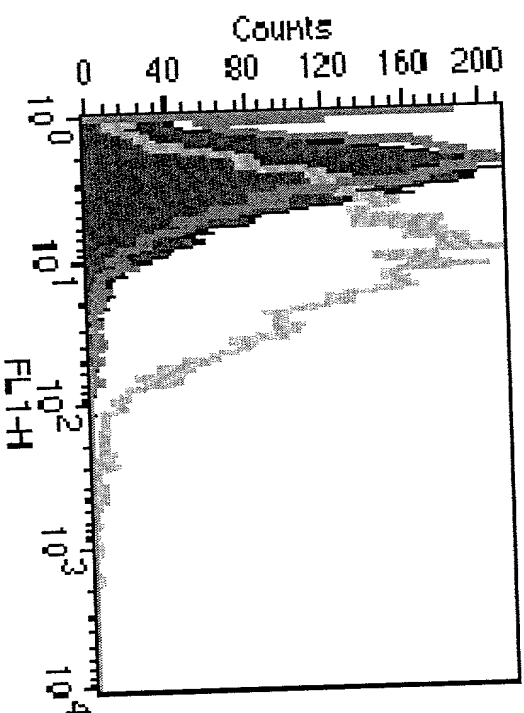


Blue; irrelevant antibody
Green; anti-O8E antibody

Fig. 19

09636801.081000

O8E Surface Expression

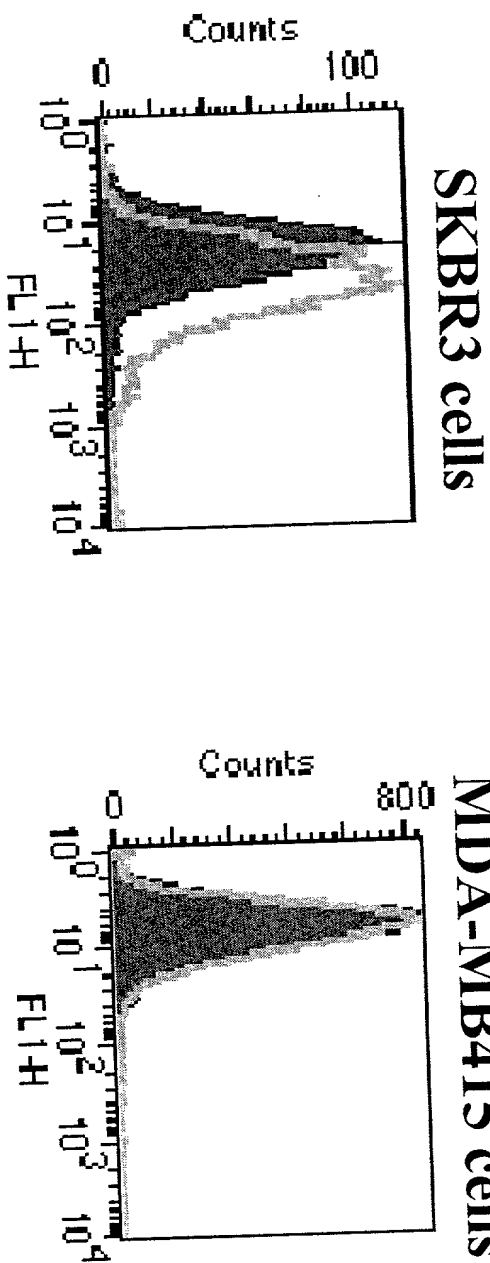


- B305D/HEK stained with anti-O8E antibody
- O8E/HEK stained with anti-O8E antibody
- O8E/HEK stained with an irrelevant antibody

FIGURE 20

09536801.081000

Surface expression of O8E



Blue; irrelevant antibody
Green; anti-O8E antibody

FIGURE 21

<110> Mitcham, Jennifer L.
King, Gordon E.
Algate, Paul A.
Fling, Steven P.
Retter, Marc W.
Fanger, Gary Richard
Reed, Steven G.
Vedvick, Thomas S.
Carter, Darrick

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<141> 2000-08-10

<160> 455

<170> FastSEQ for Windows Version 3.0

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<212> DNA

<213> Homo sapien

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ctcccaagta	gctgggatta	caggcgcccg	ccaccacget	cagctaattt	tttttgtatt	240
ttagtagag	acagggtttc	accaggttgg	ccaggctget	cttgaactcc	tgacctcagg	300
tgatccaccc	gcctcggcct	cccaaagtgc	tgggattaca	ggcgtgagcc	accacgcccg	360
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<213> Homo sapien

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aggaggttgg	cagcaagaac	aatttgaaca	ttataaaatc	aactttgatg	acagtaaaaa	240
tggcctttct	gcattgggaac	ttattgagct	tattggaaat	ggacagttta	gcaaaggcat	300
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aacagtttga	taacctcaaa	ccttcaggag	gttacataac	aggtgatcaa	gcccgtactt	180
ttttcctaca	gtcaggtctg	cgggccccgg	ttttagctga	aatatgggcc	ttatcagatc	240
tgaacaagga	tgggaagatg	qaccagcaag	agttctctat	agctatgaaa	ctcatcaaqt	300

```
<210> 6
<211> 531
<212> DNA
<213> Homo sapien
```

```
<210> 7
<211> 531
<212> DNA
<213> Homo sapien
```

```
<210> 8
<211> 531
<212> DNA
<213> Homo sapien
```

```
<400> 8
ctcac tatgttgccc aggctgttct tgaactcctg ggatcaagca atccaccocat      60
ctcc  aaaagtgctg ggatcatagg cgtgagccac ctcaccacagc caccaatttt      120
aggaa gacttttttc ttcttcaaga agtgaagggt ttccagaqta taqctacact      180
```

```

attgcttgcc tgagggtgac tacaaaattg cttgctaaaa ggtaggatg ggtaaagaat      240
tagattttct gaatgcaaaa ataaaatgtg aactaatgaa ctttaggtaa tacatattca      300
taaaataatt attcacatat ttcttgattt atcacagaaa taatgtatga aatgctttga      360
gtttcttgga gtaaaactcca ttactcatcc caagaaacca tattataagt atcactgata      420
ataagaacaa caggaccttg tcataaatte tggataagag aaatagtctc tgggtgtttg      480
ntcttaattg ataaaattta cttgtccatc ttttagttca gaatcacaaa a              531

```

```

<210> 9
<211> 531
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(531)
<223> n = A,T,C or G

```

```

<400> 9
aagcggaaat gagaaaggag ggaaaatcat gtggtattga gcggaaaact gctggatgac      60
agggctcagt cctgttggag aactctgggt ggtgctgtag aacagggcca ctcacagtgg      120
ggtgcacaga ccagcacggc tctgtgacct gtttgttaca ggtccatgat gaggtaaaca      180
atacactgag tataagggtt ggtttagaaa ctcttacagc aatttgacaa agtaatcttc      240
tgtgcagtga atctaagaaa aaaattgggg ctgtatttgt atgttccttt ttttcatttc      300
atgtttctgag ttacctattt ttattgcatt ttacaaaagc atccttccat gaaggaccgg      360
aagttaaaaa caaagcaggt cctttatcac agcactgtcg tagaacacag ttcagagtta      420
tccacccaag gagccagga gctgggctaa accaaagaat tttgcttttg gttaatcatc      480
aggtacttga gttggaattg ttttaatccc atcattacca ggctggangt g              531

```

```

<210> 10
<211> 861
<212> DNA
<213> Homo sapien

```

```

<400> 10
ccgcggctcc tgtccagacc ctgaccctcc ctcccaaggc tcaaccgtcc cccaacaacc      60
gccagccttg tactgatgtc ggtcgcgaga gcctgtgctt aagtaagaat caggccttat      120
tgagacatt caagcaaagg ttggacaact acttttccag aacagaaagg aaactcatgc      180
atcagaaaag gtgactaata aaggtaccag aagaatatgg ctgcacaaat accagaatct      240
gatcagataa aacagtttaa ggaatttctg gggacctaca ataaacttac agagacctgc      300
tttttgact gtgttagaga cttcacaaca agagaagtaa aacctgaaga gaccacctgt      360
tcagaacatt gcttacagaa atatttaaaa atgacacaaa gaatatccat gagatttcag      420
gaatatcata ttcagcagaa tgaagccctg gcagccaaag caggactcct tggccaacca      480
cgatagagaa gtcctgatgg atgaactttt gatgaaagat tgccaacagc tgctttattg      540
gaaatgagga ctcatctgat agaatcccct gaaagcagta gccaccatgt tcaaccatct      600
gtcatgactg tttggcaaat ggaaaccgct ggagaaacaa aattgctatt taccaggaat      660
aatcacaata gaaggtctta ttgttcagtg aaataataag atgcaacatt tgttgaggcc      720
ttatgattca gcagcttggt cacttgatta gaaaaataaa ccattgtttc ttcaattgtg      780
actgttaatt ttaaagcaac ttatgtgttc gatcatgtat gagatagaaa aatttttatt      840
actcaaagta aaataaatgg a              861

```

```

<210> 11

```

<400> 11

```
<210> 12
<211> 541
<212> DNA
<213> Homo sapien
```

<400> 12

```
<210> 13
<211> 441
<212> DNA
<213> Homo sapien
```

<400> 13

```
<210> 14
<211> 131
<212> DNA
```

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(131)

<223> n = A,T,C or G

<400> 14

aagcaggcgg	ctccccgcgt	cgcagggccg	tgccacctgc	ccgccccccc	gctcgcctgc	60
tcgccccgcg	cgccgcgctg	ccgaccgcca	gcatgctgcc	gagagtgggc	tgccccgcgc	120
tgccgntgcc	g					131

<210> 15

<211> 692

<212> DNA

<213> Homo sapien

<400> 15

atctcttgta	tgccaaatat	ttaatatata	tctttgaaac	aagttcagat	gaaataaaaa	60
tcaaagtttg	caaaaacgtg	aagattaact	taattgtcaa	atattcctca	ttgccccaaa	120
tcagtatttt	ttttatttct	atgcaaaagt	atgccttcaa	actgcttaaa	tgatatatga	180
tatgatacac	aaaccagttt	tcaaatagta	aagccagtca	tcttgcaatt	gtaagaaata	240
ggtaaaagat	tataagacac	cttacacaca	cacacacaca	cacacacgtg	tgacagccaa	300
tgacaaaaaa	caatttgccc	tctcctaaaa	taagaacatg	aagaccctta	attgctgcca	360
ggagggaaca	ctgtgtcacc	cctccctaca	atccaggtag	tttcccttaa	tccaatagca	420
aatctgggca	tatttgagag	gagtgattct	gacagccacg	ttgaaatcct	gtggggaacc	480
attcatgtcc	accactgggt	gccctgaaaa	aatgcccaata	atttttcgct	cccactttctg	540
ctgctgtctc	ttccacatcc	tcacatagac	cccagaccgc	ctggccccctg	gctgggcatc	600
gcattgctgg	tagagcaagt	cataggtctc	gtctttgacg	tcacagaagc	gatacaccaa	660
attgcctggg	cggtcattgt	cataaccaga	ga			692

<210> 16

<211> 728

<212> DNA

<213> Homo sapien

<400> 16

cagacggggg	ttcactatgt	tggttaggct	ggctctgaac	tcttgacttc	aggtgatctg	60
cctgccttgg	cctcccaaag	tgctgggatt	acaggcataa	gccactgcgc	ccggctgatc	120
tgatggtttc	ataaggcttt	tccccctttt	gtcagcact	tctccttcct	gccgccatgt	180
gaagaaggac	atgtttgctt	ccccctccac	cacgattgta	agttgtttcc	tgaggcctcc	240
ccggccatgc	tgaactgtga	gtcaattaaa	cctctttcct	ttataaatta	tccagttttg	300
ggtatgtctt	tattagtaga	atgagaacag	actaatataa	cccttaaagg	agactgacgg	360
agaggattct	tcttgatcc	cagcacttcc	tctgaatgct	actgacattc	ttcttgagga	420
ctttaaactg	ggagatagaa	aacagattcc	atggctcagc	agcctgagag	cagggaggga	480
gccaagctat	agatgacatg	ggcagcctcc	cctgaggcca	ggtgtggccg	aacctgggca	540
gtgctgccac	ccacccccacc	agggccaagt	cctgtccttg	gagagccaag	cctcaatcac	600
tgctagcctc	aagtgtcccc	aagccacagt	ggctaggggg	actcagggaa	cagttcccag	660
tctgccctac	ttctcttacc	tttacccttc	atacctccaa	agtagaccat	gttcatgagg	720
tccaaagg						728

```
<220>
<221> misc_feature
<222> (1)...(531)
<223> n = A,T,C or G
```

```
<210> 18
<211> 1041
<212> DNA
<213> Homo sapien
```

<400> 18						
ctctgtggaa	aactgatgag	gaatgaattt	accattaccc	atgtttctcat	ccccagcaa	60
agtgtctgggt	ctgattactg	caacacagag	aacgaagaag	aacttttctct	catacaggat	120
cagcagggcc	tcatcacact	gggctggatt	catactcacc	ccacacagac	cgcgtttctc	180
tccagtgtcg	acctacacac	tactgtctct	taccagatga	tgttgccaga	gtcagtagcc	240
attgtttgct	cccccaagtt	ccaggaaact	ggattcttta	aactaactga	ccatggacta	300
gaggagattt	cttctgtcg	ccagaaagga	tttcatccac	acagcaagga	tccacctctg	360
ttctgtagct	gcagccacgt	gactgtttgt	gacagagcag	tgaccatcac	agaccttoga	420
tgagcgtttg	agtccaacac	cttccaagaa	caacaaaacc	atatcagtgt	actgtagccc	480
cttaatttaa	gctttctaga	aagcttttga	agtttttgt	gatagtagaa	aggggggcat	540
cacntgagaa	agagctgatt	ttgtatttca	ggtttgaaaa	gaaataactg	aacatatttt	600
ttaggcaagt	cagaaagaga	acatggtcac	ccaaaagcaa	ctgtaactca	gaaattaagt	660
tactcagaaa	ttaagtagct	cagaaattaa	gaaagaatgg	tataatgaac	ccccatatac	720
ccttccttct	ggattcacca	attgttaaca	tttttttct	ctcagctatc	cttctaattt	780
ctctctaatt	tcaatttggt	tatattttacc	tctgggctca	ataagggcat	ctgtgcagaa	840
atttggaagc	catttagaaa	atcttttgg	ttttcctgtg	gtttatggca	atatgaattg	900
agcttattac	tggggtgagg	gacagcttac	tccatttgac	cagattgttt	ggctaacaca	960
tcccgaagaa	tgattttgtc	aggaattatt	gttatttaac	aaatatttca	ggatatTTTT	1020
cctctacaat	aaagtaacaa	t				1041

<400> 19

```
<210> 20
<211> 448
<212> DNA
<213> Homo sapien
```

<400> 20

```
<210> 21
<211> 411
<212> DNA
<213> Homo sapien
```

<400> 21

ggcagtgaca	ttcaccatca	tgggaaccac	cttccctttt	cttcaggatt	ctctgtagt	60
gaagagagca	cccagtggtg	ggctgaaaac	atctgaaagt	agggagaaga	acctaaaata	120
atcagtatct	cagagggtct	taagggtcca	agaagtctca	ctggacattt	aagtgccaac	180
aaaggcatac	tttcggaatc	gccaagtcaa	aactttctaa	cttctgtctc	tctcagagac	240
aagtggagact	caagagtcta	ctgctttagt	ggcaactaca	gaaaactggt	gttaccaca	300


```
<210> 22
<211> 896
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1) ... (896)
<223> n = A,T,C or G
```

```
<210> 23
<211> 111
<212> DNA
<213> Homo sapien
```

```
<210> 24
<211> 531
<212> DNA
<213> Homo sapien
```

```
<220>  
<221> misc_feature  
<222> (1) ... (531)  
<223> n = A,T,C or G
```

<400> 24
tgcaagtcac gggagtttat ttattttaatt tttttcccca gatggagact ctgtcgccca 60

```
<210> 25
<211> 471
<212> DNA
<213> Homo sapien
```

<400>	25						
aatct	kagaaagatg	tgcggttttc	ttttaatgaa	tgagagaagc	ccatttgtat		60
aatca	ttgagaaaag	gcggcggttg	cgacagcggc	gacctaggga	tcgatctgga		120
ctggg	gagcgtgcag	agacctctag	ctcgagcgcg	agggacctcc	cgccgggatg		180
ggagc	agatggaccc	tactggaagt	cagttggatt	cagattttctc	tcagcaagat		240
ctgcc	tgataattga	agattctcag	cctgaaagcc	aggttctaga	ggatgattct		300
ccact	tcagtatgct	atctcgacac	cttcctaate	tccagacgca	caaagaaaat		360
gttgg	atgttgngtc	caatccttga	acaaacagct	ggagaagaac	gaggagaccg		420
agtgg	gttcaatgaa	catttgaaag	aaaaccaggt	tgcacaccct	g		471

<400>	26					
ccctg	aacaaggggac	ctctgaccag	agagctgcag	gagatgcaga	gtggtggcag	60
gaagc	caaagaacac	ccaccttcct	cccttgaagg	agtagagcaa	ccatcagaag	120
gtttt	attgctctgg	tcaaacaagt	cttcctgagt	tgacaaaacc	tcaggctctg	180
ctctg	aatctgcagt	ccactttcca	taagttcttg	tgcagacaac	tgttcttttg	240
atagc	agcaacagat	gctttggggc	taaaaggcat	gtcctctgac	cttgccaggtg	300
ctttg	ctctttttaca	acatgtacat	ccttactggg	ctgtgctgtc	acaggggatgt	360
ctgga	ctgttctgct	atggggatat	cttcgttggg	ctgttcttca	tgcttaattg	420
ctagc	atccacatca	gacagcctgg	tataaccaga	gttgggtggt	actgattgta	480
ctttt	gtccacttca	tatggcacaa	gtattttcct	caacatcctg	gctctgggaa	540
						541

```
<210> 27
<211> 461
<212> DNA
<213> Homo sapien
```

<220>
 <221> misc_feature
 <222> (1)...(461)
 <223> n = A,T,C or G

<400> 27
 gaaatgtata tttaatcatt ctcttgaacg atcagaactc traaatcagt tttctataac 60
 arcatgtaat acagtcaccg tggctccaag gtccaggaag gcagtggta acacatgaag 120
 agtgtgggaa gggggctgga aacaaagtat tcttttcctt caaagcttca ttcctcaagg 180
 cctcaattca agcagtcatt gtccttgctt tcaaaaagtct gtgtgtgctt catggaagg 240
 atatgtttgt tgccttaatt tgaattgtgg ccaggaaggg tctggagatc taaattcaga 300
 gtaagaaaac ctgagctaga actcaggcat ttctcttaca gaacttggct tgcagggtag 360
 aatgaangga aagaaactta gaagctcaac aagctgaaga taatcccatc aggcatttcc 420
 cataggcctt gcaactctgt tcaactgagag atgttatcct g 461

<210> 28
 <211> 541
 <212> DNA
 <213> Homo sapien

<400> 28
 agtctggagt gagcaacaa gagcaagaaa caarragaag ccaaaagcag aaggctccaa 60
 tatgaacaag ataaatctat cttcaaagac atattagaag ttgggaaaat aattcatgtg 120
 aactagacaa gtgtgttaag agtgataagt aaaatgcacg tggagacaag tgcattccca 180
 gatctcaggg acctccccct gcctgtcacc tggggagtga gaggacagga tagtgcatgt 240
 tctttgtctc tgaattttta gttatatgtg ctgtaatgtt gctctgagga agccccctgga 300
 aagtctatcc caacatatcc acatcttata ttccacaaat taagctgtag tatgtaccct 360
 aagacgctgc taattgactg ccacttcgca actcaggggc ggctgcattt tagtaatggg 420
 tcaaattgatt cactttttat gatgcttccc aaggtgcctt ggcttctctt cccaactgac 480
 aaatgcccaa gttgagaaaa atgatcataa ttttagcata aaccgagcaa tcggcgaccc 540
 c 541

<210> 29
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 29
 tagctgtctt cctcactctt atggcaatga ccccatatct taatggatta agataatgaa 60
 agtgtatttc ttacactctg tatctatcac cagaagctga ggtgatagcc cgcttgatcat 120
 tgtcatccat attctgggac tcaggcggga actttctgga atattgccag ggagcatggc 180
 agaggggcac agtgcattct gggggaatgc acattggctc agcctgggta atgagtata 240
 tacattacct ctgttcacaa ctcatgtccc agcaccagtc acaaggcccc accaaatacc 300
 agagcccaag aaatgtagtc ctgttgatat ggttttgctg tgtcccaacc caaatctcat 360
 cttgaattgt aagctcccat aattcccatg tgttggtggga gggacctggt g 411

<210> 30
 <211> 511
 <212> DNA
 <213> Homo sapien

<400> 30

atcatgagga	tgttaccaa	gggatggtac	taaaccattt	gtattcgtct	gttttcacac	60
tgctttgaag	atactacctg	agactgggta	at ttataaac	aaaagagatt	taattgactc	120
acagttctgc	atggctgaag	aggcctcagg	aaacttacag	tcatgggtgga	aggcaaagga	180
ggagcaaggc	atgtcttaca	tgtcagtagg	agagagagcg	agagcaggag	aacctgccac	240
ttataaacca	ttcagatctc	ataactccct	atcatgagaa	aaacatggag	gaaaccaccc	300
tcatgatcca	atcacctccc	gccagggtccc	tcctctcgaca	cgtgggggatt	ataattcagg	360
attagaggga	cacagagaca	aaccatatca	tcattcatga	gaaatccacc	ctcatagtcc	420
aatcagctcc	taccaggccc	cacctccaac	actgggggatt	gcaattcaac	atgagatttg	480
gatggggaca	cagattcaaa	ccatatcata	c			511

<210> 31

<211> 827

<212> DNA

<213> Homo sapien

<400> 31

catggccttt	ctccttagag	gccagagggtg	ctgccctggc	tgggagtga	gctccaggca	60
ctaccagctt	tcctgatttt	cccgttttgt	ccatgtgaag	agctaccacg	agccccagcc	120
tcacagtgtc	cactcaaggg	cagcttggtc	ctcttgctct	gcagaggcag	gctgggtgtga	180
ccctgggaac	ttgacctggg	aacaacaggt	ggcccagagt	gagtgtggcc	tggccctca	240
acctagtgtc	cgctctctc	tctcctggag	ccagtcttga	gtttaaaggc	attaagtgtt	300
agatacaagc	tccttggtgc	tggaaaaaca	cccctctgct	gataaagctc	agggggcact	360
gaggaagcag	aggcccttg	ggggtgccct	cctgaagaga	gcgtcaggcc	atcagctctg	420
tcctctgtgt	gtctccacgt	ctgttcctca	ccctccatct	ctgggagcag	ctgcacctga	480
ctggccacgc	gggggcagtg	gaggcacagg	ctcagggtgg	cggggctacc	tggcacctta	540
tggcttacaa	agtagagttg	gccagtttc	cttccacctg	aggggagcac	tctgactcct	600
aacagtcttc	cttgccctgc	catcatctgg	ggtggctggc	tgtcaagaaa	ggccgggcat	660
gctttctaaa	cacagccaca	ggaggcttgt	agggcatctt	ccagggtggg	aaacagtctt	720
agataagtaa	ggtgacttgc	ctaaggcttc	ccagcaccct	tgatcttgga	gtctcacagc	780
agactgcatg	tsaacaactg	gaaccgaaaa	catgcctcag	tataaaa		827

<210> 32

<211> 291

<212> DNA

<213> Homo sapien

<400> 32

ccagaacctc	cttctctttg	gagaatgggg	aggcctcttg	gagacacaga	gggtttcacc	60
ttggatgacc	tctagagaaa	ttgcccaaga	agcccacctt	ctgggtccaa	cctgcagacc	120
ccacagcagt	cagttgggtc	ggcctgctg	tagaagggtc	cttgggtcca	ttgcctgctt	180
ccaaccaatg	ggcaggagag	aaggccttta	tttctcgccc	acctattctc	ctgtaccagc	240
acctccgttt	tcagtcagy	ttgtccagca	acgggtaccgt	ttacacagtc	a	291

<210> 33

<211> 491

<212> DNA

<213> Homo sapien

<400> 33

tgcatgtagt	tttatttatg	tgttttsgtc	tggaaaacca	agtgtcccag	cagcatgact	60
------------	------------	------------	------------	------------	------------	----

```
<210> 34
<211> 521
<212> DNA
<213> Homo sapien
```

<400> 34						
cgga	agaagccaag	gccaaggagc	tgggtgcggca	gctgcagctg	gaggccgagg	60
aggaa	gcagaagaag	cggcagagtg	tgtcgggcct	gcacagatac	cttcacttgc	120
ggaaa	tgaaaattac	cctgtgtctt	tggatgcaga	cggtgatgtg	atttccttcc	180
ataac	caacagttag	aagacaaagg	ttaagaaaac	gacttctgat	ttgttttttg	240
acaag	tgccaccagt	ctgcagattt	gcaaggatgt	catggatgcc	ctcattctga	300
gcaag	aaatgaaaaa	gtacacttta	gaaaataaag	aggaaggatc	actctcagat	360
agccg	atgcagtctc	tggacaactt	ccagatccca	caacgaatcc	cagtgcctgga	420
cgggc	ccttccttct	ggtggtggaa	cangtcccg	tggtggaatc	tgggaanggaa	480
angtg	gtgtaccccc	tccaaqqccg	accttggcc	c		521

```
<210> 35
<211> 161
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(161)
<223> n = A,T,C or G
```

<400>	35					
tccgcgcgtc	gcagggcncg	tgccacctgc	cyltccgcc	gctcgtctgc	tgcgccgcg	60
cgcgcgcgtg	cgcaccgyca	gcattgtgcc	gagagtgggc	tgccccgcgc	tgcctgtgcc	120
gccgccgccg	ctgctgccgc	tqctgccqct	qctgctgctg	c		161

```
<210> 36
<211> 341
<212> DNA
<213> Homo sapien
```

<400> 36

```

ggcgggtagg catggaactg agaagaacga agaagctttc agactacgtg gggaagaatg      60
aaaaaaccaa aattatcgcc aagattcagc aaaggggaca gggagctcca gcccagagagc    120
ctattattag cagtgaggag cagaagcagc tgatgctgta ctatcacaga agacaagagg      180
agctcaagag attggaagaa aatgatgatg atgcctattt aaactcacca tgggcggaata    240
acactgcttt gaaaagacat tttcatggag tgaaagacat aaagtggaga ccaagatgaa      300
gttcaccagc tgatgacact tccaaagaga ttagctcacc t                                341

```

```

<210> 37
<211> 521
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(521)
<223> n = A,T,C or G

```

```

<400> 37
tctgaagggtt aaatgtttca tctaaatagg gataatgrta aacacctata gcatagagtt      60
gtttgagatt aaatgagata atacatgtaa aattatgtgc ctggcataca gcaagattgt    120
tgttgttgtt gatgatgatg atgatgatga taatattttt ctatccccag tgcacaactg      180
cttgaacctt ttagataatc aatacatgtt tcttgaactg agatcaattt ccccatgttg      240
tctgactgat gaagccctac attttcttct agaggagatg acatttgagc aagatcttaa      300
agaaaatcag atgccttcac ctgaccactg cttggtgatc ccatggcact ttgtacatct      360
ctccattagc tctcatctca ccagcccatc attattgtat gtgctgcctt ctgaagcttg      420
cagctggcta ccatcmggtg gaataaaaat catcctttca taaaatagtg accctccttt      480
tttatttgca tttcccaaag ccaagcaccg tggganggta g                                521

```

```

<210> 38
<211> 461
<212> DNA
<213> Homo sapien

```

```

<400> 38
tatgaagaag ggaaaagaag ataatttgtg aaagaaatgg gtccagttac tagtctttga      60
aaagggtcag tctgtagctc ttcttaatga gaataggcag ctttcagttg ctgagggtca    120
gatttcctta gtggtgtatc taatcacagg aaacatctgt ggttccctcc agtctctttc      180
tgggggactt gggcccaact ctcatctcat ttaattagag gaaatagaac tcaaagtaca      240
atttactgtt gtttaacaat gccacaaaga catggttggg agctatttct tgatttgtgt      300
aaaatgctgt ttttgtgtgc tcataatggt tccaaaaatt ggggtgctggc caaagagaga      360
tactgttaca gaagccagca agaagacctc tgttcattca ccccccgagg gatatcagga      420
attgactcca gtgtgtgcaa atccagtttg gcctatcttc t                                461

```

```

<210> 39
<211> 769
<212> DNA
<213> Homo sapien

```

```

<400> 39
tgagggactg attggtttgc tctctgctat tcaattcccc aagcccactt gttcctgcag      60
cgtcctcctt ctcatctcct ttagttgtac cctctctttc atctgagacc tttccttctt      120

```

```
<210> 40
<211> 292
<212> DNA
<213> Homo sapien
```

```
<210> 41
<211> 406
<212> DNA
<213> Homo sapien
```

```
<210> 42
<211> 381
<212> DNA
<213> Homo sapien
```

<400>	42					
aaactggacc	tgcaacaggg	acatgaattt	actgcarggt	ctgagcaagc	tcagcccttc	60
tacctcaggg	ccccacagcc	atgactacct	cccccaggag	cgggaggggtg	aagggggcct	120
gtctctgcaa	gtggagccag	agtggaggaa	tgagctctga	agacacagca	cccagccttc	180
tgcaccagc	caagccttaa	ctgcctgcct	gacctgaac	cagaaccag	ctgaactgcc	240
cctccaaggg	acaggaaggc	tgggggaggg	agtttacaac	ccaagccatt	ccaccccttc	300
ccttgctggg	gagaatgaca	catcaagctg	ctaacaattg	ggggaagggg	aaggaagaaa	360
actctgaaaa	caaaatcttg	t				381

<210> 43
 <211> 451
 <212> DNA
 <213> Homo sapien

<400> 43
 catgcgtttc accactgttg gccaggctgg tctcgaactc ctggcctcaa gcaatccacc 60
 cgcctcagcc tccaaaagtg ctgggattac agatgtgagc catggcacca tgccaaaagg 120
 ctatattcct ggctctgtgt ttccgagact gcttttaatc ccaacttctc tacattttaga 180
 ttaaaaaata ttttattcat ggtcaatctg gaacataatt actgcatctt aagtttccac 240
 tgatgtatat agaaggctaa aggcacaatt tttatcaaatt ctagtagagt aaccaaacad 300
 aaaatcatta attactttca acttaataac taattgacat tcctcaaaag agctgttttc 360
 aatcctgata gggtctttat tttttcaaaa tatatttgcc atgggatgct aatttgcaat 420
 aaggcgcata atgagaatac cccaaactgg a 451

<210> 44
 <211> 521
 <212> DNA
 <213> Homo sapien

<400> 44
 gttggacccc cagggactgg aaagacactt cttgcccag ctgtggcggg agaagctgat 60
 gttccttttt attatgcttc tggatccgaa tttgatgaga tgtttgtggg tgtgggagcc 120
 agccgtatca gaaatctttt tagggaagca aaggcgaatg ctcttctgtg tatatttatt 180
 gatgaattag attctgttgg tgggaagaga attgaatctc caatgcatcc atattcaagg 240
 cagaccataa atcaacttct tgctgaaatg gatggtttta aaccatga aggagttatc 300
 ataataggag ccacaaactt cccagaggca ttagataatg ccttaataacc gtcctggctg 360
 ttttgacatg caagttacag ttccaaggcc agatgtaaaa ggtcgaacag aaattttgaa 420
 atggtatctc aataaaataa agtttgatca atccggtga tccagaaatt atagcctcga 480
 ggtactggtg gcttttccgg aagcagagtt gggagaatct t 521

<210> 45
 <211> 585
 <212> DNA
 <213> Homo sapien

<400> 45
 gcctacaaca tccagaaaga gtctaccctg cacctgggtg tscgtctcag aggtgggatg 60
 cagatcttcg tgaagaccct gactggtaag accatcactc tcgaagtggg gccgagtgac 120
 accatygaga acgtcaaagc aaagatccar gacaaggaag gcrtycctcc tgaccagcag 180
 aggttgatct ttgccggaaa gcagctggaa gatggdcgca cctgtctga ctacaacatc 240
 cagaaagagt cyaccctgca cctggtgctc cgtctcagag gtgggatgca ratcttcgtg 300
 aagaccctga ctggtaagac catcaccctc gaggtggagc ccagtgcac catcgagaat 360
 gtcaaggcaa agatccaaga taaggaaggc atccctcctg atcagcagag gttgatcttt 420
 gctgggaaac agctggaaga tggacgcacc ctgtctgact acaacatcca gaaagagtcc 480
 actctgcact tggctcctgc cttgaggggg ggtgtctaag tttcccttt taagggttcm 540
 acaaatttca ttgcactttc ctttcaataa agttgttgca ttccc 585

<210> 46
 <211> 481

<212> DNA

<213> Homo sapien

<400> 46

```

gaactggggcc ctgagcccaa gtcattgcctt gtgtccgcat ctgccgtgtc acctctgtkc      60
ctgccccctca cccctccctc ctggtcttct gagccagcac catctccaaa tagcctattc      120
cttcctgcaa atcacacaca catgcgggcc acacatacct gctgccctgg agatggggaa      180
gtaggagaga tgaatagagg cccatacatt gtacagaagg aggggcaggt gcagataaaa      240
gcagcagacc cagcggcagc tgaggtgcat ggagcacggt tggggccggc attgggctga      300
gcacctgatg ggctcatct cgtgaatcct cgaggcagcg ccacagcaga ggagttaagt      360
ggcacctggg ccgagcagag caggagactg agggtcagag tggaggctaa gctgccctgg      420
aactcctcaa tcttgctgc cccctagtat gaagccccct tctgccccct acaattcctg      480
a                                                    481

```

<210> 47

<211> 461

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(461)

<223> n = A,T,C or G

<400> 47

```

atggatctta ctttgccacc cagggttgag tgcagtgtg caatcttggc tcaactgcagc      60
cttaacctcc caggctcaag ctatcctcct gccaaagcct tccacatagc tgggactaca      120
ggtacacngc caccacaccc agctaaaatt tttgtatctt ttgtagagac gggatctcgc      180
cacgttgccc aggtctgtcc catcctgacc tcaagcagat ctgccacact cagcccccca      240
acgtgctagg attacaggcg tgagccaccg caccacagct ttgttttgct tttaatggaa      300
tcaccagttc cctccctgtg ctcagcagca gctgtgagaa atgctttgca tctgtgacct      360
ttatgaaggg gaacttccat gctgaatgag ggtaggatta catgtcctg tttcccgagg      420
gtcaagaaag cctcagactc cagcatgata agcagggtga g                                                    461

```

<210> 48

<211> 571

<212> DNA

<213> Homo sapien

<400> 48

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ataggggctt taaggaggga attcagggtc aatgaggctg taaggccagg gctcttatcc      60
agtaagactg gggtccttag atgagaaaga gacaccogag gtccttctct ctgccgtgtg      120
aggatgcatc aagaaggcgg ccgtctgcaa gcgaaggaga ggccgcacca gaaaccgaca      180
ccttcatctt ggacttgag cctctagaac tgagaaaata actgtctgtt ggttaagcca      240
cccagtttgt agtattctct tatggcttcc taagcagact aacaaacaaa caccacaaat      300
taactgatgg cttcgctgtc ttctgtaaaa attgctatga gagaactttt cactcactgt      360
tttgagttt ctcctcagt ccttggttct ttcttctcac ataatcccaa tttcaattta      420
tagttcatgg ccaggcaga gtcattcatt acggcatctc ctgagctaaa ccagcacctg      480
ctctgtcac ttcttgactg gctgtctcatt atcagccctc ttgcagagat ttcatttctt      540
cccgtgccag gtacttcacg caccaagctc a                                                    571

```

<210> 49
 <211> 511
 <212> DNA
 <213> Homo sapien

<400> 49
 ggataatgaa gttgttttat ttagcttgga caaaaaggca tttcctcta ttttcttata 60
 caacaaatat ccccaaaata aagcaagcat atatatcttg aatgtgtaat aatccagtga 120
 taaacaagag cagtacttta aaagaaaaaa aaatatgtat ttctgtcagg ttaaaatgag 180
 aatcaaaacc atttactctg ctaactcatt attttttgc ttttttttgg ttaagagagg 240
 caatgcaata cactgaaaaa ggtttttata ttatctggca ttggaattag acatattcaa 300
 accccagccc ccattttcaa actttaagac cacaacaag taatttactt ttctgaacat 360
 tggttttttc tggaaaatgg gaattataaa atagactttg cagactctta tgagattaaa 420
 taagataatg tatgaaattc tttcttcttt tttacttctt tttccttttt gagatggagt 480
 ctcaccccg t caccaggtt ggagtacagt g 511

<210> 50
 <211> 561
 <212> DNA
 <213> Homo sapien

<400> 50
 ccactgcact ccagcctggg tgacggagtg agactctgtc tcaaaaaaac aaacaaacaa 60
 acaaacaaaa aactgaaaag gaaatagagt tctcttttcc tcatatatga atatattatt 120
 tcaacagatt gttgatcacc taccatatgc ttggtattgt tctaattgct ggggatacag 180
 caagagggttc tgcagaactt catggagcat gaaagtaaat aaacaaagtt aatttcaagg 240
 ccaggcatgg ttgctcacac ctttagtccc agcacttttg gaggctgagg cagggtggatc 300
 acttggggccc aggagttcaa ggctgcagtg agccaagatt gtgccactac tctccaggct 360
 gggcaacaga gcaagaccct gtctcagggg gaacaaaaag ttaatttcag attttggttaa 420
 gtgctgtaaa ggaagtaaat aggttgatat tcaagagagc acctgaaggc caggcggtgg 480
 ggctcacgcc tgtggtctaa cgctttggga agcccgagcg ggcggatcac aaggtcagga 540
 gaattttggc caggcatggt g 561

<210> 51
 <211> 451
 <212> DNA
 <213> Homo sapien

<400> 51
 agaatccatt tattgggttt taaactagtt acacaactga aatcagtttg gcactacttt 60
 atacagggat tacgcctgtg tatgccgaca cttaaatact gtaccaggac cactgctgtg 120
 cttaggtctg tattcagtca ttcagcatgt agatactaaa aatatactgt agtgttcctt 180
 taaggaagac tgtacagggt gtgttgcaag atgacattca ccaatttggt aattatttca 240
 acccagaaga tacctttcac tctataaact tgtcataggc aaacatgtgg tgttagcatt 300
 gagagatgca cacaaaaatg ttacataaaa gtccagacat tctaatagata agtgaactga 360
 aaaaaaaaaa aaccccatat ctcaattttt gtaacaagat aaagaaaata atttaaaaac 420
 acaaaaaatg gcattcagtg ggtacaaagc c 451

<210> 52
 <211> 682
 <212> DNA

<213> Homo sapien

<400> 52

caaataattta	atataaatct	ttgaaacaag	ttcagakgaa	ataaaaatca	aagtttgcaa	60
aaacgtgaag	attaacttaa	ttgtcaaata	ttcctcattg	ccccaatca	gtatTTTTTT	120
tatttctatg	caaaagtatg	ccttcaaact	gcttaaata	tatatgatat	gatacacaaa	180
ccagttttca	aatagtaaag	ccagtcattc	tgcaattgta	agaaatagg	aaaagattat	240
aagacacctt	acacacacac	acacacacac	acacacacgt	gtgcacccgc	aatgacaaaa	300
aacaatttgg	cctctcctaa	aataagaaca	tgaagaccct	taattgctgc	caggagggaa	360
cactgtgtca	ccccctccta	caatccaggt	agtttccttt	aatccaatag	caaattctggg	420
catatttgag	aggagtgtat	ctgacagcca	csgttgaaat	cctgtgggga	accattcatg	480
tccaccact	gggtgccctga	aaaaatgcc	ataatttttc	gtcccaactt	ctgctgctgt	540
ctcttcaca	tcctcacata	gacccagac	ccgctggccc	ctggtgggc	atcgattgc	600
tggtagagca	agtcattagg	ctcgtctttg	acgtcacaga	agcgatacac	caaattgcct	660
ggtcggtcat	tgtcataacc	ag				682

<210> 53

<211> 311

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(311)

<223> n = A,T,C or G

<400> 53

tttgacttta	gtaggggtct	gaactattta	ttttactttg	ccmgtaatat	ttaraccyta	60
tatatctttc	attatgccat	cttatcttct	aatgbcaagg	gaacagwtgc	taamctggct	120
tctgcattwa	tcacattaaa	aatggctttc	ttggaaaatc	ttcttgatat	gaataaagga	180
tcttttavag	ccatcattta	aagcmgntt	ctctccaaca	cgagtctgct	sasgggggk	240
gagctgtgaa	ctctggctga	aggctttccc	atacacactg	caatgacmtg	gtttctgacc	300
agbgtgagtt	a					311

<210> 54

<211> 561

<212> DNA

<213> Homo sapien

<400> 54

agagaagccc	cataaatgca	atcagtgtgg	gaaggccttc	agtcagagct	caagcctttt	60
cctccatcat	cgggttcata	ctggagagaa	accctatgta	tgtaatgaat	gcggcagagc	120
ctttggtttt	aactctcatc	ttactgaaca	cgtaaggatt	cacacaggag	aaaaacccta	180
tgtttgtaat	gagtgcggca	aagcctttcg	tcggagtcc	actcttgctc	agcatcgaag	240
agttcacact	ggggagaagc	cctaccagtg	cgttgaaatg	gggaaagctt	tcagccagag	300
ctcccagctc	accctacatc	agccgagtcc	acactggaga	gaagccctat	gactgtggtg	360
actgtgggaa	ggccttcagc	cggaggtcaa	ccctcattca	gcacagaaa	gttcacagcg	420
gagagactcg	taagtgcaga	aaacatggtc	cagcctttgt	tcattggctcc	agcctcacag	480
cagatggaca	gattcccact	ggagagaagc	acggcagaac	ctttaaccat	ggtgcaaatc	540
tcattctgcg	ctggacagtt	c				561

<210> 55
 <211> 811
 <212> DNA
 <213> Homo sapien

<400> 55
 gagacagggc ctcactttgt caccagggc ggaatgcagt ggtgcgatct tacgtagctc 60
 actgcagccc tgacctcctg gactcaaaca attctcctgc ctcagccctg caagtagctg 120
 ggactgtggg tgcacatgct catgcctggc taacttttgt agtttttgta aagatggggg 180
 tttgccatgt tgcacatgct ggtcttgaac tctgagctc aaacgatctg cccacctcgg 240
 cctcccagaa tgttgggatt acaggggtaa accaccacgc ctggcccat tagggattc 300
 ttagcatcca cttgctcact gagattaatc ataagagatg ataagcactg gaagaaaaaa 360
 atttttacta ggctttggat atttttttcc tttttcagct ttatacagag gattggatct 420
 ttagttttcc tttaactgat aataaaacat tgaaaggaaa taagtttacc tgagattcac 480
 agagataacc ggcactcact ccttgcctca ttccagtctt taccacatca attattttca 540
 gaggtgcagg ataaaggcct ttagtctgct ttgcgacttt ttcttccact tttttgtaaa 600
 cctgttgccg gacaaatgga attgacagcg tatgccatga ctattccatt tgtcaggcat 660
 acgctgtcaa tttttccacc aatcccttgt ctctctttgg agagatcttc ttatcagcta 720
 gtcctttggc aaaagtaatt gcaacttctt ctagggtattc tattgtccgt tccactgggtg 780
 gaaccctcgg gaccaggact aaaacctcca g 811

<210> 56
 <211> 591
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(591)
 <223> n = A,T,C or G

<400> 56
 atctcatata tatattttctt cctgacttta tttgcttgcct tctgnacgc atttaaaata 60
 tcacagagac caaaatagag cggctttctg gtggaacgca tggcagtcac aggacaaaat 120
 acaaaactag ggggctctgt cttctcatac atcatacaat tttcaagtat tttttttatg 180
 tacaaagagc tactctatct gaaaaaaaat taaaaaataa atgagacaag atagttttatg 240
 catcctagga agaaagaatg ggaagaaaga acggggcagt tgggtacaga ttctgtctcc 300
 ctgttcccag ggaccactac cttcctgcca ctgagttccc ccacagcctc acccatcatg 360
 tcacagggca agtgccaggg taggtgggga ccagtggaga caggaaccag caacatactt 420
 tggcctggaa gataaggaga aagtctcaga aacacactgg tgggaagcaa tcccacnngc 480
 cgtgccccan gagcttccca cctgctgctg gctccctggg tggctttggg aacagcttgg 540
 gcaggccctt ttgggtgggg nccaactggg cctttggggc cgtgtggaaa g 591

<210> 57
 <211> 481
 <212> DNA
 <213> Homo sapien

<400> 57
 aaacattgag atggaatgat agggtttccc agaatcaggt ccatatttta actaaatgaa 60
 aattatgatt tatagccttc tcaaatacct gccatacttg atatctcaac cagagctaata 120

tttacctctt	tacaaattaa	ataagcaagt	aactggatcc	acaatttata	atacctgtca	180
atTTTTtctg	tattaaacct	ctatcatagt	ttaagcctat	tagggtactt	aatccttaca	240
aataaacagg	tttaaaatca	cctcaatagg	caactgccct	tctggttttc	ttctttgact	300
aaacaatctg	aatgcttaag	atTTTccact	ttgggtgcta	gcagtacaca	gtgttacact	360
ctgtattcca	gacttcttaa	attatagaaa	aaggaatgta	cactttttgt	attctttctg	420
agcagggccg	ggaggcaaca	tcctctacca	tggtagggac	ttgtatgcat	ggactacttt	480
a						481

<210> 58

<211> 141

<212> DNA

<213> Homo sapien

<400> 58

actctgtcgc	ccaggctgga	gcccabtggm	gcgatctcga	ctccctgcaa	gctmcgcctc	60
acaggtcat	gccattctcc	tgctcagca	tctggagtag	ctgggactac	aggcgccagc	120
caccatgccc	agctaatttt	t				141

<210> 59

<211> 191

<212> DNA

<213> Homo sapien

<400> 59

accttaaaga	cataggagaa	tttatactgg	gagagaaagc	ttacaaatgt	aaggtttctg	60
acaagacttg	ggagtgattc	acacctggaa	caacatactg	gacttcacac	tggabagaaa	120
ccttacaagt	gtaatgagt	tggcaaagcc	tttggcaagc	agtcaacact	tattcaccat	180
caggcaattc	a					191

<210> 60

<211> 480

<212> DNA

<213> Homo sapien

<400> 60

agtcaggatc	atgatggctc	agtttccac	agcgatgaat	ggagggccaa	atatgtgggc	60
tattacatct	gaagaacgta	ctaagcatga	taaacagttt	gataacctca	aaccttcagg	120
aggttacata	acaggtgatc	aagcccgtac	ttttttccta	cagtcaggtc	tgccggcccc	180
ggtttttagct	gaaatatggg	ccttatcaga	tctgaacaag	gatgggaaga	tggaccagca	240
agagttctct	atagctatga	aactcatcaa	gttaaagttg	cagggccaac	agctgcctgt	300
agtctccct	cctatcatga	aacaaccccc	tatgttctct	ccactaatct	ctgctcgttt	360
tgggatggga	agcatgccca	atctgtccat	tcctcagcca	ttgcctccag	ttgcacctat	420
agcaacaccc	ttgtcttctg	ctacttcagg	gaccagtatt	cctccctaata	gatgcctgct	480

<210> 61

<211> 381

<212> DNA

<213> Homo sapien

<400> 61

ctttcgattt	ccttcaattt	gtcacgtttg	atTTTatgaa	gttgttcaag	ggctaactgc	60
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09536801-034000

tgtgtattat	agctttctct	gagttccttc	agctgattgt	taaatgaatc	catttctgag	120
agcttagatg	cagtttcttt	ttcaagagca	tctaattggt	ctttaagtct	ttggcataat	180
tcttcttttt	ctgatgactt	tctatgaagt	aaactgatcc	ctgaatcagg	tgtgttactg	240
agctgcatgt	ttttaattct	ttcgtttaat	agctgcttct	cagggaccag	atagataagc	300
ttattttgat	attccttaag	ctcttggtga	agttgttcga	ttcccataat	ttccagggtca	360
cactgggttat	cccaaacttc	t				381

<210> 62

<211> 906

<212> DNA

<213> Homo sapien

<400> 62

gtggaggtga	aacggaggca	agaaaggggg	ctacctcagg	agcgagggac	aaagggggcg	60
tgaggcacct	aggccgcggc	accccggcga	caggaagccg	tcctgaaccg	ggctaccggg	120
taggggaagg	gcccgcgtag	tcctgcagg	gccccagagc	tggagtcggc	tccacagccc	180
cgggcccgtc	gcttctcact	tcctggacct	ccccggcgcc	cgggcctgag	gactggctcg	240
gcggagggag	aagaggaaac	agacttgagc	agctccccgt	tgtctcgcaa	ctccactgcc	300
gaggaaactct	catttcttcc	ctcgtctcct	cacccccac	ctcatgtaga	aagggtgctga	360
agcgtccgga	gggaagaaga	acctgggcta	ccgtcctggc	cttcccmccc	ccttcccggg	420
gcgctttggt	gggcgtggag	ttgggggttg	gggggtgggt	gggggttctt	ttttggagt	480
ctggggaaact	tttttccctt	cttcagggtca	ggggaaagg	aatgccaat	tcagagagac	540
atgggggcaa	gaaggacggg	agtggaggag	cttctggaac	tttgagccg	tcacggggag	600
gcggcagctc	taacagcaga	gagcgtcacc	gcttggtatc	gaagcacaag	cggcataagt	660
ccaaacactc	caaagacatg	gggttggtga	ccccgaagc	agcatccctg	ggcacagtta	720
tcaaaccttt	ggtggagtat	gatgatatca	gctctgattc	cgacaccttc	tccgatgaca	780
tggccttcaa	actagaccga	agggagaacg	acgaacgtcg	tggatcagat	cggagcgacc	840
gcctgcacaa	acatcgtcac	caccagcaca	ggcgttcccc	ggacttacta	aaagctaaac	900
agaccg						906

<210> 63

<211> 491

<212> DNA

<213> Homo sapien

<400> 63

gacatgtttg	cctgcagggg	accagagaca	atgggattag	ccagtgtctca	ctgttcttta	60
tgcttccaga	gaggatgggg	acagctctca	ggtcagaatc	caggctgaga	aggccatgct	120
ggttgggggc	ccccggaagc	acggtccgga	tcctccctgg	catcagcgta	gacccgctgc	180
tcaggcttgg	ggtaccaaac	tcagtctctg	tactgttttg	gccccatgcy	gtgagaggaa	240
aacctagaaa	aagattgggtc	gtgctaagga	atcagctgcc	ccctcatcct	ccgcatacaa	300
tgctgggtgac	aacatattcc	ctctcccagg	acacagactc	ggtgactcca	cactgggctg	360
agtggcctct	ggaggctcgt	ggcctaaggc	agggctccgt	aaggctgata	ggctgaactg	420
ggtgggggtga	gggtttctga	cccttcgctt	cccattccat	aaccgctgtc	aatgagctca	480
cactgtggtc	a					491

<210> 64

<211> 511

<212> DNA

<213> Homo sapien

0933601.03.000

<400> 64

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gctgcagcca	ggggccagag	tcagttcagg	gagtggtcct	cggccctcaa	agctcctccg	180
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caacccctc	gctgcctg	cctccatca	ggaggagcca	gtggaacctt	cggaaagctc	420
ccagcatctc	agcagccctc	aaaagtcgct	ctggggcaag	ctctggttct	cctgactgga	480
ggtcactctg	gcttggcctg	ctctctctcg	c			511

<210> 65

<211> 394

<212> DNA

<213> Homo sapien

<400> 65

taaaaaagtg	taacaaaggt	ttatttagac	tttcttcattg	ccccagatc	caggatgtct	60
atgtaaaccg	ttatcttaca	aagaaagcac	aatatattggt	ataaactaag	tcagtgactt	120
gcttaactga	aatagcgtcc	atccaaaagt	gggtttaagg	taaaactacc	tgacgatatt	180
ggcggggatc	ctgcagtttg	gactgcttgc	cgggtttgtc	cagggttccg	ggtctgttct	240
tggcactcat	ggggacaggc	atcctgctcg	tctgtggggc	cccgtggag	cccttacgtg	300
aagctgaagg	tatcgaccst	agggggctct	agggcagtg	gaccttcac	cggaaactaac	360
aagggtcggg	gagaggcctc	ttgggctatg	tggg			394

<210> 66

<211> 359

<212> DNA

<213> Homo sapien

<400> 66

caagcgttcc	tttatggatg	taaattcaaa	cagtcattgct	gagccatccc	gggctgacag	60
tcacgttwaa	gacactaggt	cgggcgccac	agtgccaccc	aaggagaaga	agaatttgga	120
atTTTTccat	gaagatgtac	ggaaatctga	tgttgaatat	gaaaatggcc	cccaaattgga	180
attccaaaag	gttaccacag	gggctgtaag	acctagtgc	cctcctaagt	gggaaagagg	240
aatggagaat	agtatttctg	atgcatcaag	aacatcagaa	tataaaactg	agatcataat	300
gaaggaaaat	tccatatcca	atatgagttt	actcagagac	agtagaaact	attcccagg	359

<210> 67

<211> 450

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(450)

<223> n = A,T,C or G

<400> 67

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agtggaggag	gacacaggac	tagccaccca	ccttctcttc	ccggtctccc	aagatgactg	180

cttatagagt	ggaggaggca	aacagggtccc	ctcaatgtac	cagatgggtca	cctatagcac	240
cagctccaga	tggccacgtg	gttgcagctg	gactcaatga	aactctgtga	caaccagaag	300
atacctgctt	tgggatgaga	gggaggataa	agccatgcag	ggaggatatt	taccatccct	360
accctaagca	cagtgcgaagc	agtgcagcccc	eggctcccag	tacctgaaaa	accaaggcct	420
actgnctttt	ggatgctctc	ttggggccacg				450

<210> 68

<211> 511

<212> DNA

<213> Homo sapien

<400> 68

aagcctcctg	ccctggaaat	ctggagcccc	ttggagctga	gctggacggg	gcagggagggg	60
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cacagcagaa	acgccagcag	agaaaatggg	agccgagagt	ccttagccct	ggagctgagg	180
ctgcctctgg	gctgacccgc	tggctgtacg	tggccagaac	tggggttggc	atctggcatc	240
catttgaggc	caggggtggag	gaaagggagg	ccaacagagg	aaaacctatt	cctgctgtga	300
caacacagcc	cttgtccac	gcagcctaag	tgaggggagc	gtgatgaagt	caggcagcca	360
gtcggggagg	acgaggtaac	tcagcagcaa	tgtcaccttg	tagcctatgc	gctcaatggc	420
ccggaggggc	agcaaccccc	cgcacacgtc	agccaacagc	agtgccctctg	caggcaccaa	480
gagagcgatg	atggacttga	gcgccgtgtt	c			511

<210> 69

<211> 511

<212> DNA

<213> Homo sapien

<400> 69

gtttggcaga	agacatgttt	aataacattt	tcatatttaa	aaaatacagc	aacaattctc	60
tatctgtcca	ccatcttgcc	ttgcccttcc	tggggctgag	gcagacaaag	gaaaggtaat	120
gaggttaggg	ccccaggcg	ggctaagtgc	tattggcctg	ctcctgctca	aagagagcca	180
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gttcttctact	gagccgtggg	ctgcagtctc	gcagggagaa	cttctgcacc	agccctggct	300
ctacggcccc	aaagaggtgg	agccctgaga	accggaggaa	aacatccatc	acctccagcc	360
cctccagggc	ttctctctct	tcttggcctg	ccagttcacc	tgccagccgg	gctcgggccg	420
ccaggtagtc	agcgtttag	aagcagccct	ccgcagaagc	ctgcgggtca	aatctccccg	480
ctataggagc	ccccggggag	gggtcagcac	c			511

<210> 70

<211> 511

<212> DNA

<213> Homo sapien

<400> 70

caagttgaac	gtcaggcttg	gcagaggtgg	agtgtagatg	aaaacaaagg	tgtgattatg	60
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acttttacct	gtgcaaaaag	cacattttcc	acctccttct	catggcattt	gtgtaagggtg	180
agtatgattc	ctattccatc	tgcatttttag	aggtgaagaa	taacgtacaa	gggattcagt	240
gattagcaag	ggacccctca	ctaagtgttg	atggagttag	gacagagctc	agctgtttga	300
atctcagagc	ccaggcagct	ggagctgggt	aggatcctgg	agctggcact	aatgtgaggt	360
gcattccctc	caaccaggc	tcagatccgg	aacctgaccg	tgctgacccc	cgaaggggag	420

<213> Homo sapien

<400> 84

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cttctagctg	ggacaaaagt	tctttgtttt	ccccctgtag	agtatcacag	accttctgct	180
gaagctggac	ctctgtctgg	gccttggact	cccaaactctg	cttgtcatgt	tcaagcctgg	240
aaatgttaat	ctttaattct	tccatatgga	tggacatctg	tctaagttga	tccttttagaa	300
cactgcaatt	atcttctttg	agtctaattt	cttcttcttt	gctttgaatc	gcatcactaa	360
acttctctct	ccatttctta	gcttcatcta	tcaccctgtc	acgatcatcc	tggagggaag	420
acatgctctt	agtaaaggct	gcaagctggg	tcacagtact	gtccaagttt	tcctgaagtt	480
gctgaacttc	cttgtctttc	ttgttcaaag	taacctgaat	ctctccaatt	gtctcttcca	540
agtggacttt	ttctctgcgc	aaagcatcca	g			571

<210> 85

<211> 561

<212> DNA

<213> Homo sapien

<400> 85

tcattgcttg	tgatggcatc	tggaatgtga	tgagcagcca	ggaagttgta	gatttcatct	60
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aagttaagaa	gcacagaggc	aaacaagaag	gagacagaaa	agcagttgca	ggaagctgag	180
caagaaatgg	aggaaatgaa	agaaaagatg	agaaagtttg	ctaaatctaa	acagcagaaa	240
atcctagagc	tggaagaaga	gaatgaccgg	cttagggcag	aggtgcaccc	tgaggagat	300
acagctaaag	agtgtatgga	aacacttctt	tcttccaatg	ccagcatgaa	ggaagaactt	360
gaaaggggtca	aaatggagta	tgaaaccctt	tctaagaagt	ttcagtcttt	aatgtctgag	420
aaagactctc	taagtgaaga	ggttcaagat	ttaaagcatc	agatagaagg	taatgtatct	480
aaacaagcta	acctagaggc	caccgagaaa	catgataacc	aaacgaatgt	cactgaagag	540
ggaacacagt	ctataccagg	t				561

<210> 86

<211> 795

<212> DNA

<213> Homo sapien

<400> 86

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cacagctcaa	gtaagttagg	aaactgagcc	aagtatacac	agaatacgaa	gtggcaaaac	180
tagaaggaaa	gactgacact	gctatctgct	ggcctccagt	gtcctggctc	ttttcacacg	240
ggttcaatgt	ctccagcgct	gctgctgctg	ctgcattacc	atgcctcat	tgtttttctt	300
cctctgggtg	tcaactgcat	ccttcaaaga	atctaactca	ttccagagac	cacttatttc	360
tttctctctt	tctgaaatta	cttttaataa	ttcttcatga	gggggaaaag	aagatgcctg	420
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tacatcctgt	aacagctgtg	ttttgctaga	aagatcactc	tcctctctct	ttagcatggc	540
ttctaacctc	ttcaattcat	tttctttttc	tttcaacaca	atctcaagtt	cttcaaactg	600
tgatgcagaa	gaggcctctt	tcaagttatg	ttgtgctact	tcctgaacat	gtgcttttaa	660
agattcattt	tcttcttgaa	gatcctgtaa	ccacttcctc	gtattggcta	ggctcttctc	720
tttctcttcc	aaaacagcct	tcatggtatt	catctgttcc	tcttttctct	tttaataagtt	780
caggagcttc	agaac					795

<210> 87
 <211> 594
 <212> DNA
 <213> Homo sapien

<400> 87
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 caactgggtt tatgtcttca ttttttatat ttttgtaaat taaaaaaatt acaagtttta 120
 aatagccaat ggctgggttat attttcagaa aacatgatta gactaattca ttaatgggtg 180
 cttcaagctt ttccttattg gctccagaaa attcacccac cttttgtccc ttcttaaaaa 240
 actggaatgt tggcatgcat ttgacttcac actctgaagc aacatcctga cagtcatcca 300
 catctacttc aaggaatatc acgttggaat acttttcaga gaggggaatga aagaaaggct 360
 tgatcatttt gcaaggccca caccacgtgg ctgagaagtc aactactaca agtttatcac 420
 ctgcagcgtc caaggcttcc tgaaaagcag tcttgctctc gatctgcttc accatcttgg 480
 ctgctggagt ctgacgagcg gctgtaagga ccgatggaaa tggatccaaa gcaccaaaca 540
 gagcttcaag actcgctgct tggcttgaat tcggatccga tategccatg gcct 594

<210> 88
 <211> 557
 <212> DNA
 <213> Homo sapien

<400> 88
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 tttatatatt tgtaaattaa aaaaattmca agtttttaat agccaatggc tggttatatt 120
 ttcagaaaac atgattagac taattcatta atgggtggctt caagcttttc cttattggct 180
 ccagaaaatt caccacactt ttgtcccttc ttaaaaaact ggaatgttgg catgcatttg 240
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 ttggaatact tttcagagag ggaatgaaag aaaggcttga tcattttgca aggccacac 360
 cactgtggctg agaagtcaac tactacaagt ttatcacctg cagcgtccaa ggcttcctga 420
 aaagcagtct tgctctcgat ctgcttcacc atcttggctg ctggagtctg acgagcggct 480
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 catgaattcg gatccga 557

<210> 89
 <211> 561
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(561)
 <223> n = A,T,C or G

<400> 89
 tacaaacttt attgaaacgc acacgcgcac acacacaaac acccctgtgg atagggaaaa 60
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 gccacaacc cttctgaca gggaaggcct tagattgagg cccacacctc catgggtgatg 180
 gggagctcag aatggggctc agggagaatt tgggttaggg gaggtgctag ggaggcatga 240
 gcagagggca ccctccgagt ggggtcccgagg gggctgcaga gtcttcagta ctgtccctca 300


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aaccggagcg cgagcagtag ctgggtgggc accatggctg ggatcaccac catcgaggcg      60
gtgaagcgca agatccaggt tctgcagcag caggcagatg atgcagagga gcgagctgag    120
cgctccagc  gagaagttga gggagaaagg cgggcccggg aacaggctga ggctgagggtg    180
gcctccttga accgtaggat ccagctggtt gaagaagagc tggaccgtgc tcaggagcgc     240
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atccaactca aagaagctaa gcacattgca gaagaggcag ataggaagta tgaagagggtg    420
gctcgtaagt tggatgatcat tgaaggagac ttggaacgca cagaggaacg agctgagctg    480
gcagagtccc gttgccgaga gatggatgag cagattagac tgatggacca gaacctgaag    540
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<210> 93

<211> 531

<212> DNA

<213> Homo sapien

<400> 93

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gatctggttt tctggatagc caggtcatag catgggtatc agtaggaatc cgctgtagct    120
gcacaggcct cacttgctgc agttccgggg agaacacctg cactgcatgg cgttgatgac    180
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cgagggcagg cagcaggagc attgctcctg cacatcctcg atgtcaatgg agtacacagc     300
tttgctggca cactttccct ggcagtaatg aatgtccact tcctcttggg acttacaatc     360
tcccactttg atgtactgca ccttggctgt gatgtctttg caatcaggct cctcacatgt    420
gtcacagcag gtgcctggaa ttttcacgat tttgcctcct tcagccagac acttgtgttc     480
atcaaattgg gggcagcccg tgaccctctt ctcccagatg tactctcctc t          531

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<210> 94

<211> 531

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(531)

<223> n = A,T,C or G

<400> 94

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tctcctgttc ggggtggagga gacgtgtggc tgccgctgga cctgcccttg tgtgtgcacg    180
ggcagttcca ctcggcacat cgtcaccttc gatgggcaga atttcaagct tactggtagc     240
tgctcctatg tcatctttca aaacaaggag caggacctgg aagtgtcctt ccacaattggg    300
gcctgcagcc ccggggcaaa acaagcctgc atgaagtcca ttgagattaa gcatgctggc     360
gtctctgctg agctgcacag taacatggag atggcagtgg atgggagact ggtccttgcc     420
ccgtacgttg gtgaaaacat ggaagtcagc atctacggcg ctatcatgta tgaagtcagg     480
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<210> 95

<211> 605

<212> DNA

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gaccgacgag	atcaacttcc	tcaggcagct	gtatgaagag	gagatccggg	agctgcagtc	720
ccagatctcg	gacacatctg	tgggtgctgtc	catggacaac	agccgctccc	tggacatgga	780
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ggatgacctg	cggcgacaaa	agactgagat	ctctgagatg	aaccgggaac	atcagcccgg	960
ctncaggctg	agattgaggg	cctcaaaggc	caganggctt	nctggangn	ccgccat	1017

<210> 98

<211> 561

<212> DNA

<213> Homo sapien

<400> 98

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ggcagggggc	taccagggg	cttctatcc	tggggcctac	cccgggcagg	cacccccagg	180
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gaatgatgtt	gccttccact	ttaaccacg	cttcaatgag	aacaacagga	gagtcattgg	540
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<210> 99

<211> 636

<212> DNA

<213> Homo sapien

<400> 99

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tggtgtagtc	agacagggtr	cgwccatctt	ccagctgttt	yccrgcaaag	atcaacctct	180
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acagggtgcg	yccatcttcc	agctgctttc	csagcaaaga	tcaacctctg	ctggtcagga	420
ggratgcctt	ccttgctcyt	gatctttgcy	ttgacrttct	caatgggtgtc	actcggctcc	480
acttcgagag	tgatggctct	accagtcagg	gtcttcacga	agatctgcat	cccacctcta	540
agacggagca	ccaggtgcag	ggtggactct	ttctggatgg	ttgtagtcag	acagggtgcg	600
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<210> 100

<211> 697

<212> DNA

<213> Homo sapien

<400> 100

aggttgatct	ttgctgggaa	acagctggaa	gatggacgca	ccctgtctga	ctacaaccat	60
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ccagaaagag	tccaccctgc	acctggtgct	cogtcttaga	ggtgggatgc	agatcttcgt	120
gaagaccctg	actggttaaga	ccatcactct	cgaagtggag	ccgagtgaca	ccattgagaa	180
ygtcaargca	aagatccarg	acaaggaagg	catyocctct	gaccagcaga	ggttgatctt	240
tgctsggaaa	gcagctggaa	gatggrogca	ccctgtctga	ctacaacatc	cagaaagagt	300
cyaccctgca	cctggtgctc	cgtctcagag	gtgggatgca	ratcttcgtg	aagaccctga	360
ctggtaagac	catcaccctc	gaggtggagc	ccagtgcac	catcgagaat	gtcaaggcaa	420
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ytggtmctbc	gtctyagagg	kgggrtgcaa	atctwmgtkw	agacactcac	tkkyaagryy	600
atcamcmwtg	akktcgakys	castkwact	wcrakaamg	tyrwwgcawa	gatccmagac	660
aaggaaggca	ttcctcctga	ccagcagagg	ttgatct			697

<210> 101

<211> 451

<212> DNA

<213> Homo sapien

<400> 101

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aggcaggcgt	caccataatt	tttgatcttt	tagtagagac	atggtttcgc	catgttggct	180
gggctggtct	cgaactcctg	acctcaagtg	atctgtcctg	gcctcccaa	gtgttgggat	240
tacaggcgaa	agccaacgct	cccggccagg	gaacaacttt	agaatgaagg	aaatatgcaa	300
aagaacatca	catcaaggat	caattaatta	ccatctatta	attactatat	gtgggtaatt	360
atgactatct	ccaagcatt	ctacgttgac	tgcttgagaa	gatgtttgtc	ctgcatgggtg	420
gagagtggag	aagggccagg	attcttaggt	t			451

<210> 102

<211> 571

<212> DNA

<213> Homo sapien

<400> 102

agcgcggtct	tccggcgcga	gaaagctgaa	ggtgatgtgg	ccgccctcaa	ccgacgcac	60
cagctcgttg	aggaggagtt	ggacagggct	caggaacgac	tggccacggc	cctgcagaag	120
ctggaggagg	cagaaaaagc	tgcagatgag	agtgagagag	gaatgaagg	gatagaaaac	180
cgggccatga	aggatgagga	gaagatggag	attcaggaga	tgcagctcaa	agaggccaag	240
cacattgcgg	aagaggctga	ccgcaaatac	gaggaggtag	ctcgtaagct	ggcatcctg	300
gaggggtgagc	tggagagggc	agaggagcgt	gcggaggtgt	ctgaactaaa	atgtggtgac	360
ctggaagaag	aactcaagaa	tgttactaac	aatctgaaat	ctctggaggc	tgcacttgaa	420
aagtattctg	aaaaggagga	caaatatgaa	gaagaaatta	aacttctgtc	tgacaaactg	480
aaagaggctg	agaccctg	tgaatttgca	gagagaacgg	ttgcaaaaact	ggaaaagaca	540
attgatgacc	tggaagagaa	acttgcccag	c			571

<210> 103

<211> 451

<212> DNA

<213> Homo sapien

<400> 103

gtgcacagggt	cccattttatt	gtagaaaata	ataataatta	cagtgatgaa	tagctcttct	60
-------------	-------------	------------	------------	------------	------------	----

taaattacaa aacagaaacc acaaagaagg aagaggaaaa accccaggac ttccaaggggt 120
gaagctgtcc cctcctccct gccaccctcc caggctcatt agtgtccttg gaaggggcag 180
aggactcaga ggggatcagt ctccaggggc cctgggctga agcgggtgag gcagagagtc 240
ctgaggccac agagctgggc aacctgagcc gcctctcttg cccctcccc caccactgcc 300
caaacctgtt tacagcacct tcgcccctcc cctctaaacc cgtccatcca ctctgcactt 360
cccaggcagg tgggtgggccc aggcctcagc catactcctg ggcgcggggt tcggtgagca 420
aggcacagtc ccagaggtga tatcaaggcc t 451

<210> 104

<211> 441

<212> DNA

<213> Homo sapien

<400> 104

gcaaggaact ggtctgctca cacttgettg cttgcgcac aggactggct ttatctcctg 60
actcacggtg caaagggtga ctctgcgaac gttaagtcog tccccagcgc ttggaatcct 120
acggccccc cagccggtac cctcagcct tccaggctct caactcccg ggacgctgaa 180
caatggcctc catggggcta caggtaatgg gcacgcgct ggcggtcctg ggctggctgg 240
ccgtcatgct gtgtgcgcgc ctgcccattg ggcgcgtgac ggccttcac ggcagcaaca 300
ttgtcacctc gcagaccatc tgggagggcc tatggatgaa ctgcgtgggtg cagagcaccg 360
gccagatgca gtgcaagggtg tacgactcgc tgctggcact gccgcaggac ctgcaggcgg 420
cccgcgcct cgtcatcac a 441

<210> 105

<211> 509

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(509)

<223> n = A,T,C or G

<400> 105

tgcaaaagg acacaggggt tcaaaaataa aaatttctct tccccctccc caaacctgta 60
cccagctcc ccgaccacaa ccccttctct ccccgggga aagcaagaag gagcagggtg 120
ggcatctgca gctgggaaga gagaggccgg ggaggtgcc agctcgggtg tggctctctt 180
ccaaatataa atacntgtgt cagaactgga aaatctcca gcaccacca cccaagcact 240
ctccgttttc tgccggtgtt tggagagggg cggggggcag ggcgcgcagg caccggctgg 300
ctgcggtcta ctgcatccgc tgggtgtgca cccgcgcagc ctctgctgc tcattgtaga 360
agagatgaca ctcggggtcc ccccgatgg tgggggctcc ctggatcagc ttcccggtgt 420
tgggggtcac acaccagcac tccccacgt gcccggtcag agacatcttg cactgtttga 480
ggtgtacag gccatgcttg tcacagttg 509

<210> 106

<211> 571

<212> DNA

<213> Homo sapien

<400> 106

gggttgagg gactggttct ttatttcaaa aagacacttg tcaatattca gtatcaaac 60

```

agttgcacta ttgattttctc tttctcccaa tgggccccaa agagaccaca taaaaggaga 120
gtacatttta agccaataag ctgcaggatg tacacctaac agacctccta gaaaccttac 180
cagaaaatgg ggactgggta gggaaggaaa cttaaaagat caacaaactg ccagcccacg 240
gactgcagag gctgtcacag ccagatgggg tggccagggt gccacaaacc caaagcaaag 300
tttcaaaata atataaaatt taaaaagttt tgtacataag ctattcaaga tttctccagc 360
actgactgat acaaagcaca attgagatgg cacttctaga gacagcagct tcaaaccacg 420
aaaaggggtga tgagatgagt ttcacatggc taaatcagtg gcaaaaacac agtcttcttt 480
ctttctttct ttcaaggagg caggaaagca attaagtggg cacctcaaca taagggggac 540
atgatccatt ctgtaagcag ttgtgaaggg g 571

```

<210> 107

<211> 555

<212> DNA

<213> Homo sapien

<400> 107

```

caggaaccgg agcgcgagca gtagctgggt gggcaccatg gctgggatca ccaccatcga 60
ggcgggtgaag cgcaagatcc aggttctgca gcagcaggca gatgatgcag aggagcgagc 120
tgagcgctc cagcgagaag ttgagggaga aaggcggggc cgggaacagg ctgaggctga 180
ggtggcctcc ttgaaccgta ggatccagct ggttgaagaa gagctggacc gtgctcagga 240
gcgctggcc actgccctgc aaaagctgga agaagctgaa aaagctgctg atgagagtga 300
gagaggtatg aaggttattg aaaaccgggc cttaaaagat gaagaaaaga tggaactcca 360
ggaaatccaa ctcaaagaag ctaagcacat tgcagaagag gcagatagga agtatgaaga 420
ggtggctcgt aagttgggtga tcattgaagg agacttggaa cgcacagagg aacgagctga 480
gctggcagag tcccgttgcc gagagatgga tgagcagatt agactgatgg accagaacct 540
gaagtgtctg agtgc 555

```

<210> 108

<211> 541

<212> DNA

<213> Homo sapien

<400> 108

```

atctacgtca tcaatcaggc tggagacacc atgttcaatc gagctaagct gctcaatatt 60
ggctttcaag aggccttgaa ggactatgat tacaactgct ttgtgttcag tgatgtggac 120
ctcattccga tggacgaccg taatgcctac aggtgttttt cgcagccacg gcacatttct 180
gttgcaatgg acaagttcgg gtttagcctg ccatatgttc agtatatttg aggtgtctct 240
gctctcagta aacaacagtt tcttgccatc aatggattcc ctaataatta ttgggggttg 300
ggaggagaag atgacgacat ttttaacaga ttagttcata aaggcatgtc tatatcacgt 360
ccaaatgctg tagtagggag gtgtcgaatg atccggcatt caagagacaa gaaaaatgag 420
cccaatcctc agagggttga ccggatcgca catacaaagg aaacgatgcg cttcgatgg 480
ttgaactcac ttacctacaa ggtgttggat gtcagagata cccgttatat acccaaatca 540
c 541

```

<210> 109

<211> 411

<212> DNA

<213> Homo sapien

<400> 109

```

ctagacctct aattaaaagg cacaatcatg ctggagaatg aacagtctga ccccgagggc 60

```

cacagcgaat	tttagggaag	gaggcaaaga	ggtgagaagg	gaaaggaaag	aaggaaggaa	120
ggagaacaat	aagaactgga	gacgttgggt	gggtcaggga	gtgtggtgga	ggctcggaga	180
gatggtaaac	aaacctgact	gctatgagtt	ttcaacccca	tagtctaggg	ccatgagggc	240
gtcagttctt	ggtggctgag	ggtccttcca	cccagcccac	ctgggggagt	ggagtgggga	300
gttctgccag	gtaagcagat	gttgtctccc	aagttcctga	cccagatgtc	tggcaggata	360
acgctgacct	gttcctca	caagggacct	gaaagtaatt	ttgctcttta	c	411

<210> 110

<211> 451

<212> DNA

<213> Homo sapien

<400> 110

ccgaattcaa	gcgtcaacga	tccytccctt	accatcaa	caattggcca	ccaatggtac	60
tgaacctacg	agtacaccga	ctacgggcgg	actaatcttc	aactcctaca	tacttcccc	120
attattccta	gaaccaggcg	acctgcgact	ccttgacgtt	gacaatcgag	tagtactccc	180
gattgaagcc	cccattcgta	taataattac	atcacaagac	gtcttgcaact	catgagctgt	240
ccccacatta	ggcttaaaaa	cagatgcaat	tcccggaagt	ctaagccaaa	ccactttcac	300
cgctacacga	ccgggggtat	actacgggtc	atgctctgaa	atctgtggag	caaaccacag	360
tttcatgccc	atcgctcctag	aattaattcc	cctaaaaatc	tttgaaatag	ggcccgtatt	420
tacctatag	cacccctct	acccctcta	g			451

<210> 111

<211> 541

<212> DNA

<213> Homo sapien

<400> 111

gctcttcaca	cttttattgt	taattctctt	cacatggcag	atacagagct	gtcgtcttga	60
agaccaccac	tgaccaggaa	atgccacttt	tacaaaatca	tccccctttt	tcatgattgg	120
aacagttttc	ctgaccgtct	gggagcggtt	aagggtgacc	agcacatttg	cacatgcaaa	180
aaaggagtga	ccccaaaggcc	tcaaccacac	ttcccagagc	tcaccatggg	ctgcaggtga	240
cttgccaggt	ttgggggttcg	tgagctttcc	ttgctgctgc	ggtggggagg	ccctcaagaa	300
ctgagaggcc	gggggtatgct	tcatgagtgt	taacatttac	gggacaaaag	cgcatcatta	360
ggataaggaa	cagccacagc	acttcatgct	tgtgagggtt	agctgtagga	gcgggtgaaa	420
ggattccagt	ttatgaaaat	ttaaagcaaa	caacggtttt	tagctgggtg	ggaaacagga	480
aaactgtgat	gtcggccaat	gaccaccatt	tttctgccc	tgtgaaggtc	cccatgaaac	540
c						541

<210> 112

<211> 521

<212> DNA

<213> Homo sapien

<400> 112

caagcgcttg	gcgtttggac	ccagttcagt	gaggttcttg	ggttttgtgc	ctttggggat	60
tttggtttga	cccaggggtc	agccttagga	aggtcttcag	gaggaggccg	agttccccct	120
cagtaccacc	cctctctccc	cactttccct	ctcccggcaa	catctctggg	aatcaacagc	180
atattgacac	ggtggagccg	agcctgaaca	tgcccctcgg	ccccagcaca	tggaaaaccc	240
ccttcccttg	ctaagggtgc	tgagtttctg	gctcttgagg	catttccaga	cttgaaattc	300
tcatcagtc	attgctcttg	agtctttgca	gagaacctca	gatcaggtgc	acctgggaga	360

```

aagactttgt cccacttac agatctatct cctcccttgg gaagggcagg gaatggggac 420
ggtgtatgga ggggaaggga tctcctgcgc ccttcattgc cacacttggg gggaccatga 480
acatctttag tgtctgagct tctcaaatta ctgcaatagg a 521

```

```

<210> 113
<211> 568
<212> DNA
<213> Homo sapien

```

```

<400> 113
agcgtcaa at cagaatggaa aagactcaaa accatcatca acaccaagat caaaaggaca 60
agratccttc aagaaacagg aaaaaactcc taaaacacca aaaggaccta gttctgtaga 120
agacattaaa gcaaaaatgc aagcaagtat agaaaaaggt ggttctcttc ccaaagtgga 180
agccaaattc atcaattatg tgaagaattg cttccggatg actgaccaag aggctattca 240
agatctctgg cagtggagga agtctcttta agaaaatagt ttaaacaatt tgttaaaaaa 300
ttttccgtct tatttcattt ctgtaacagt tgatatctgg ctgtcctttt tataatgcag 360
agtgagaact ttccctaccg tgtttgataa atgttggtcca ggttctattg ccaagaatgt 420
gttggtccaaa atgcctgttt agtttttaaa gatggaactc caccctttgc ttgggttttaa 480
gtatgtatgg aatgttatga taggacatag tagtagcggg ggtcagacat ggaaatggtg 540
ggsmgacaaa aatatacatg tgaaataa 568

```

```

<210> 114
<211> 483
<212> DNA
<213> Homo sapien

```

```

<400> 114
tccgaattcc aagcgaatta tggacaaaacg attcctttta gaggattact tttttcaatt 60
tcggttttag taatctaggc ttgacctgta aagaatacaa cgatggattt taaatactgt 120
ttgtggaatg tgtttaaagg attgattcta gaacctttgt atatttgata gtattttctaa 180
ctttcatttc tttactgttt gcagttaatg ttcattgtct gctatgcaat cgtttatatg 240
cacgtttctt taattttttt agatttttct ggatgtatag tttaaacaac aaaaagtcta 300
tttaaaactg tagcagtagt ttacagttct agcaaagagg aaagttgtgg gggttaaactt 360
tgtattttct ttcttataga ggcttctaaa aagggtattt tatatgttct ttttaacaaa 420
tattgtgtac aacctttaaa acatcaatgt ttggatcaaa acaagacca gcttattttc 480
tgc 483

```

```

<210> 115
<211> 521
<212> DNA
<213> Homo sapien

```

```

<400> 115
tgtggtggcg cgggctgagg tggaggccca ggactctgac cctgcccctg ccttcagcaa 60
ggcccccggc agcgccggcc actacgaact gccgtgggtt gaaaaatata ggccagtaaa 120
gctgaatgaa attgtcggga atgaagacac cgtgagcagg ctagagggtc ttgcaaggga 180
aggaaatgtg cccaacatca tcattgcggg ccctccagga accggcaaga ccacaagcat 240
tctgtgcttg gcccgggccc tgctggggcc agcactcaaa gatgccatgt tggaactcaa 300
tgcttcaaat gacaggggca ttgacgttgt gaggaataaa attaaaatgt ttgctcaaca 360
aaaagtcact cttcccaaag gccgacataa gatcatcatt ctggatgaag cagacagcat 420
gaccgacgga gccagcaag ccttgaggag aacctgggaa atctactcta aaaccactcg 480

```


521

<400> 116

<210> 117

<211> 451

<212> DNA

<213> Homo sapien

 $\langle 220 \rangle$

<221> misc feature

 $\langle 222 \rangle \quad (1) \dots (451)$

<223> n = A, T, C or G

<400> 117

<210> 118

<211> 501

<212> DNA

<213> Homo sapien

<400> 118

tccggagccg	gggtagtcgc	cgccgccgcc	gccggtgcag	ccactgcagg	caccgctgcc	60
gccgcctgag	tagtgggctt	aggaaggaag	aggtcatctc	gctcggagct	tcgctcgga	120
gggtctttgt	tccctgcagc	cctcccacgg	gaatgacaat	ggataaaagt	gagctggtac	180
agaaagccaa	actcgtgag	caggctgagc	gatatgatga	tatggctgca	gccatgaagg	240
cagtcacaga	acaggggcat	gaactctcca	acgaagagag	aaatctgctc	tctgttgctt	300
acaagaatgt	ggtaaggccg	ccgcgcgctc	ttcctggcgt	gtcatctcca	gcattgagca	360
gaaaacagag	aggaatgaga	agaagcagca	gatgggcaaa	gagtacccgtg	agaagataga	420

```
ggcagaactg caggacatct gcaatgatgt tctggagctt gttggacaaa tatcttattc 480
caatgctaca caaccacagaa a 501
```

```
<210> 119
<211> 391
<212> DNA
<213> Homo sapien
```

```
<400> 119
aaaaagcagc argttcaaca caaaatagaa atctcaaatt taggatagaa caaaaccaag 60
tgtgtgaggg ggggaagcaac agcaaaaagga agaaatgaga tgttgcaaaa aagatggagg 120
agggttcccc tctcctctgg ggactgactc aaacactgat gtggcagtat acaccattcc 180
agagtcaggg gtgttcattc ttttttggga gtaagaaaag gtggggatta agaagacgtt 240
tctggaggct tagggaccaaa ggctgggtctc tttccccctt cccaaccccc ttgatccctt 300
tctctgatca ggggaaagga gctcgaatga gggaggtaga gttggaaagg gaaaggattc 360
cacttgacag aatgggacag actccttccc a 391
```

```
<210> 120
<211> 421
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(421)
<223> n = A,T,C or G
```

```
<400> 120
tggcaatagc acagccatcc aggagctctt cargcgcctc tcggagcagt tcaactgcat 60
gttccgcggg aaggccttcc tccactggta cacaggcgag ggcattggac agatggagtt 120
caccgaggct gagagcaaca tgaacgacct cgtctctgag tatcaagcag taccaggatg 180
ccaccgcaga agaggaggag gatttcgggtg aggaggccga agaggaggcc taaggcagag 240
cccccatcac ctcaggcttc tcagttccct tagccgtctt actcaactgc ccctttcctc 300
tccctcagaa tttgtgtttg ctgcctctat cttgtttttt gttttttctt ctgggggggt 360
ctagaacagt gcctggcaca tagtaggcgc tcaataaata cttggttgnt gaatgtctcc 420
t 421
```

```
<210> 121
<211> 206
<212> DNA
<213> Homo sapien
```

```
<400> 121
agctggcgct agggctcggt tgtgaaatac agcgtrgtca gcccttgccg tcagtgtaga 60
aaccacgcc tgtaaggctg gtcttcgtcc atctgctttt ttctgaaata cactaagagc 120
agccacaaaa ctgtaacctc aaggaaacca taaagcttgg agtgccttaa tttttaacca 180
gtttccaata aaacggttta ctacct 206
```

```
<210> 122
<211> 131
<212> DNA
```


<223> n = A, T, C or G

atgcaaaaagg	ggacacagggg	ggttcaaaaa	taaaaatttc	tcttccccct	cccaaacct	60
gtaccccgagc	tccccgacca	caacccccctt	cctcccccg	ggaaaagcaag	aaggagcagg	120
tgtggcatct	gcagctggga	agagagaggc	cggggaggtg	ccgagctcgg	tgctggtctc	180
tttccaaata	taaatacgtg	tgtcagaact	ggaaaatcct	ccagcaccca	ccacccaagc	240
actctccgtt	ttctgccggt	gtttggagag	gggcgnggg	caggggcgcc	aggcacccgc	300
tggctgcggt	ctactgcata	cgtctgggtgt	gcaccccgcg	a		341

<213> Homo sapien

<223> n = A, T, C or G

aggttgagaga	aggatcatgca	ggtgcagatt	gtccaggskc	agccacaggg	tcaagcccaa	60
caggcccaga	gtggcaactgg	acagaccatg	caggatgatgc	agcagatcat	cactaacaca	120
ggagagatcc	agcagatccc	ggtgcagctg	aatgccggcc	agctgcagta	tatccgctta	180
gcccagcctg	tatcaggcac	tcaagttgtg	cagggaacaga	tccagacact	tgccaccaat	240
gctcaacaga	ttacacagac	agaggtccag	caaggacagc	agcagttcaa	gccagttcac	300
aagatggaca	gcagctctac	cagatccagc	aagtcaccat	gctgcggggc	cangacctcg	360
ccagcccatg	ttcatccagt	caagccaacc	agcccttcna	cgggcaggcc	ccccaggtga	420
ccggcgactg	aaggggcctga	gctggcaagg	ccaangacac	ccaacacaat	ttttgccata	480
cagccccccag	gcaatgggca	cagcctttct	tcccagagga	c		521

<213> Homo sapien

tgagatttat	tgcatttcac	gcagcttgaa	gtccatgcaa	aggrgactag	cacagttttt	60
aatgcattta	aaaaataaaa	gggaggtggg	cagcaaacac	acaaagtcct	agtttcctgg	120
gtccctggga	gaaaagagtg	tggcaatgaa	tccaccact	ctccacaggg	aataaatctg	180
tctcttaaat	gcaaagaatg	tttccatggc	ctctggatgc	aaatacacag	agctctgggg	240
tcagagcaag	ggatggggag	aggaccacga	gtgaaaaagc	agctacacac	attcacctaa	300
ttccatctga	gggcaagaac	aacgtggcaa	gtcttggggg	tagcagctgt	t	351

<213> Homo sapien

<400> 128


```
<220>
<221> misc_feature
<222> (1)...(844)
<223> n = A,T,C or G
```

```
<210> 133
<211> 601
<212> DNA
<213> Homo sapien
```

```
<210> 134
<211> 421
<212> DNA
<213> Homo sapien
```

```
<210> 135
<211> 511
<212> DNA
<213> Homo sapien
```

```
<210> 136
<211> 341
<212> DNA
<213> Homo sapien
```

```
<210> 137
<211> 551
<212> DNA
<213> Homo sapien
```

<400> 137						
gatgtgttg	accctctgtg	tcaaaaaaaaa	cctcaciaag	aatccctctgc	tcattacaga	60
agaagatgca	tttaaaatat	gggttatttt	caacttttta	tctgaggaca	agtatccatt	120
aattattgtg	tcagaagaga	ttgaatacct	gcttaagaag	cttacagaag	ctatgggagg	180
aggttggcag	caagaacaat	ttgaacatta	taaaatcaac	tttgatgaca	gtaaaaatgg	240
cctttctgca	tgggaactta	ttgagcttat	tggaaatgga	cagtttagca	aaggcatgga	300
ccggcagact	gtgtctatgg	caattaatga	agtctttaat	gaacttatat	tagatgtgtt	360
aaagcagggt	tacatgatga	aaaagggccca	cagacggaaa	aactggactg	aaaqatqqt	420

```

tgtactaaaa cccaacataa tttcttacta tgtgagtga gatctgaagg ataagaaagg      480
agacattctc ttggatgaaa attgctgtgt agaagtcctt gcctgacaaa agatggaaag      540
aatgccttt t                                     551

```

```

<210> 138
<211> 531
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(531)
<223> n = A,T,C or G

```

```

<400> 138
gactggttct ttatttcaaa aagacacttg tcaatattca gtrtcaaaac agttgcacta      60
ttgatttctc tttctcccaa tcggccccaag agagaccaca taaaaggaga gtacatttta      120
agccaataag ctgcaggatg tacacctaac agacctcta gaaaccttac cagaaaaatgg      180
ggactgggta gggaaggaaa cttaaaagat caacaaactg ccagcccacg gactgcagag      240
gctgtcacag ccagatgggg tggccagggt gccacaaacc caaagcaaag tttcaaaata      300
atataaaatt taaaaagttt tgtacataag ctattcaaga tttctccagc actgactgat      360
acaaagcaca attgagatgg cacttctaga gacagcagct tcaaaccacg aaaaggggtga      420
tgagatgaag tttcacatgg ctaaatacgt ggcaaaaaca cagtcttctt tctttctttc      480
tttcaaggan gcaggaaagc aattaagtgg tcaccttaac ataaggggga c               531

```

```

<210> 139
<211> 521
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(521)
<223> n = A,T,C or G

```

```

<400> 139
tgggtgggca ccatggctgg gatcaccacc atcgaggcgg tgaagcgcaa gatccaggtt      60
ctgcagcagc aggcagatga tgcagaggag cgagctgagc gcctccagcg agaagttgag      120
ggagaaaggc gggcccggga acaggctgag gctgaggtgg cctccttgaa ccgtaggatc      180
cagctgggtg aagaagagct ggaccgtgct caggagcgcc tggccactgc cctgcaaaag      240
ctggaagaag ctgaaaaagc tgctgatgag agtgagagag gtatgaaggt tattgaaaac      300
cgggccttaa aagatgaaga aaagatggaa ctccaggaaa tccaactcaa agaagctaag      360
cacattgcag aagaggcaga taggaagtat gaagaggtgg ctcgtaagtt ggtgatcatt      420
gaaggagact tggaaccgca cagaaggaac gagcttgagc ttggcaaaag tcccgttgcc      480
cagagatggg atgaaccaga ttagactgat ggaccanaac c               521

```

```

<210> 140
<211> 571
<212> DNA
<213> Homo sapien

```


caggaaagtg gaagtgattt gatggagagc agagaagcct atgcacagtg gccgagtcca 480
cttgtaaagt g 491

<210> 143
<211> 515
<212> DNA
<213> Homo sapien

<400> 143
ttcaagcaat tgtaacaagt atatgtagat tagagtgagc aaaatcatat acaatthttca 60
tttccagttg ctatthttcca aattgttctg taatgtcgtt aaaattactt aaaaattaac 120
aaagccaaaa attatatthta tgacaagaaa gccatcccta cattaatctt actthttccac 180
tcaccggccc atctcttcc tctthttcct aactatgcc ttaaaactgt tctactgggc 240
cgggcgtgtg gctcatgcct gtaatcccag cattthtggga ggccaaggca ggcggtatcat 300
gaggtcaaga gattgagacc atcctggcca acatgggtgaa accccgcctc gactaagaat 360
acaaaaatta gctgggcatg gtggcgcatg cctgtagtct cagctactcg ggaggctgag 420
gcagaagaat cgcttgaacc cgggaggcag aggatgcagt gagccccgat cgcgccactg 480
cactctagcc tgggcgacag actgagactc tgctc 515

<210> 144
<211> 340
<212> DNA
<213> Homo sapien

<400> 144
tgtgccagtc tacaggccta tcagcagcga ctcttcagc aacagatggg gtccctgtt 60
cagcccaacc ccattgagccc ccagcagcat atgtctccaa atcaggccca gtccccacac 120
ctacaaggcc agcagatccc taattctctc tccaatcaag tgcgtctctc ccagcctgtc 180
ccttctccac ggccacagtc ccagccccc cactccagtc cttccccaag gatgcagcct 240
cagccttctc cacaccagct ttcccccacag acaagttccc cacatcctgg actggtagtt 300
gccagggcca accccatgga acaagggcatt tttgccagcc 340

<210> 145
<211> 630
<212> DNA
<213> Homo sapien

<400> 145
tgtaaaaaact tgthtttaaat tttgtataaa ataaagggtgg tccatgccca cgggggctgt 60
aggaaatcca agcagaccag ctgggggtggg gggatgtagc ctacctcggg ggactgtctg 120
tcctcaaaac gggctgagaa ggcccgtcag gggcccaggc cccacagaga ggccctgggat 180
actcccccaa cccgaggggc agactgggca gtggggagcc cccatcgtgc cccagagggtg 240
gccacaggct gaaggagggg cctgaggcac cgcagcctgc aacccccagg gctgcagtcc 300
actaacttht tacagaataa aagggaacatg gggatgggga aaaaagcacc aggtcaggca 360
gggcccagag gccccagatc ccaggagggc caggactcag gatgccagca ccaccctagc 420
agctcccaca gctcctggca caggaggccg ccacggattg gcacaggccg ctgctggcca 480
tcacgccaca tttggagaac ttgtcccgac agagggtcagc tcggaggagc tctcgtggg 540
cacacactgt acgaacacag atctccttgt taatgacgta cacacggcgg aggctgcggg 600
gacagggcac gggagggtctc agccccactt 630

<210> 146

<211> 521
 <212> DNA
 <213> Homo sapien

<400> 146

atggctgctg	gatttaggtg	gtaatagggg	ctgtgggcca	taaatctgaa	gccttgagaa	60
ccttgggtct	ggagagccat	gaagagggaa	ggaaaagagg	gcaagtcctg	aacctaacca	120
atgacctgat	ggattgctcg	accaagacac	agaagtgaag	tctgtgtctg	tgcacttccc	180
acagactgga	gtttttggtg	ctgaatagag	ccagttgcta	aaaaattggg	ggtttggtga	240
agaaatctga	ttgttggtg	tattcaatgt	gtgattttaa	aaataaacag	caacaacaat	300
aaaaaccctg	actggctgtt	ttttccctgt	attctttaca	actatTTTTT	gaccctctga	360
aaattattat	acttcacctt	aatggaagac	tgctgtgttt	gtggaaattt	tgtaattttt	420
taatttattt	tattctctct	cctttttatt	ttgcctgcag	aatccgttga	gagactaata	480
aggcttaata	tttaattgat	ttgtttaata	tgtatataaa	t		521

<210> 147
 <211> 562
 <212> DNA
 <213> Homo sapien

<400> 147

ggcatgcgag	cgcactcggc	ggacgcaagg	gcgggcgggg	gcacacggag	cactgcaggc	60
gccgggttgg	gacagcgtct	tcgctgctgc	tggatagtcg	tgTTTTTcggg	gatcgaggat	120
actcaccaga	aaccgaaaat	gccgaaacca	atcaatgtcc	gagttaccac	catggatgca	180
gagctggagt	ttgcaatcca	gccaaatata	actggaaaac	agctTTTTTga	tcagggtgga	240
aagactatcg	gcctccggga	agtgtggtac	tttggcctcc	actatgtgga	taataaaggga	300
tttctacct	ggctgaagct	ggataagaag	gtgtctgccc	aggaggtcag	gaaggagaat	360
cccctccagt	tcaagttccg	ggccaaagtt	ctaccctgaa	gatgtggctg	aggagctcat	420
ccaggacatc	accagaaaac	ttttcttctt	tcaagtgaag	gaagggaatcc	ttagcgatga	480
gatctactgc	cccccttgar	actgcctgtc	tcttgggggtc	ctacgcttgt	gcatgccaa	540
tttggggact	accaccaaga	ag				562

<210> 148
 <211> 820
 <212> DNA
 <213> Homo sapien

<400> 148

gaaggagtgc	ggatactcag	cattgatgca	ccccaatTtc	aaagcggcat	tcttcggcag	60
gtctctggga	caatctctag	ggtcactacc	tggaaactcg	ttagggtaca	actgaatgct	120
gaaaggaaaag	aacacctgca	gaaccggaca	gaaattcacc	ccggcgatca	gctgattgat	180
ctcggtcgac	cagaagtcac	ggctaaagat	gacgaggacg	ttgtcaattc	cctgggcttt	240
tcgaagttag	tccagcagca	gtctgaggta	ttcggggccgg	ttatgcacct	ggaccaccag	300
caccagctcc	cggggggccc	aggtgccagc	cttatctaca	ttctcagggg	tctgatcaaa	360
gttcagctgg	tacaccaggg	accggtaccg	cagcgtcagg	ttgtccgctc	gggctggggg	420
accgcgggga	ccagggaagc	cgccgacacg	ttggagaccc	tgcggatgcc	cacagccaca	480
gaggggtggt	ccccaccgcg	gccgcgggca	ccccgcgcgg	gttcggcgctc	cagcaacggt	540
ggggcgaggg	cctcgttctt	cctttgtcgc	ccattgctgc	tccagaggac	gaagccgcag	600
gcggccacca	cgagcgtcag	gattagcacc	ttccgtttgt	agatgcggaa	cctcatggctc	660
tccagggccg	ggagcgcagc	tacagctcga	gcgtcggcgc	cgccgctagg	agccgcggct	720
cggcttcgtc	tccgtcctct	ccattcagca	ccacgggtcc	cggaaaaagc	tcagccscgg	780

820

<213> Homo sapien

cagattttta	tttgcagtcg	tcaactggggc	cgtttctctgc	tgtttatttg	tctgctagcc	60
tgctcttcca	gctgcatggc	cagggcgcaag	gccttgatga	catctcgag	ggctgagaaa	120
tgcttggtt	gctgggccag	agcagattcc	gctttgttca	caaagggtctc	caggtcatag	180
tctggctgct	cggtcatctc	agagagctca	agccagtctg	gtccttgctg	tatgatctcc	240
ttgagctctt	ccatagcctt	ctcctccagc	tccttgatct	gagtcatggc	ttcgtaaag	300
ctggacatct	gggaagacag	ttcctcctct	tccttgata	aattgcctgg	aatcagcgcc	360
ccgttagagc	aggettcct	ctcttctgtt	tccatttgaa	tcaactgctc	tccactgggc	420
ccactgtggg	ggctcagctc	cttgaccctg	ctgcatactc	taagggtgtt	taaaggatat	480
tcacaggagc	ttatgctgg	t				501

<213> Homo sapien

<223> n = A, T, C or G

ctctctcttg	tacatgaacc	caagttgaaa	gtggacttaa	caaagtatct	ggagaaccaa	60
gcattctgct	ttgactttgc	at ttgatgaa	acagcttcga	atgaagttgt	ctacaggttc	120
acagcaaggc	cactggtaca	gacaatcttt	gaagggtggaa	aagcaacttg	ttttgcata	180
ggccagacag	gaagtggcaa	gacacatact	atgggcggag	acctctctgg	gaaagcccag	240
aatgcatcca	aagggatcta	tgccatggcc	ttccgggacg	tcttcttctg	aagaatcaac	300
cctgctaccg	gaagtggggc	ctggaagtct	atgtgacatt	cttcgagatc	tacaatggga	360
agctgtttga	cctgctcaac	aagaaggcca	agcttgcgcg	tgctggaaga	cggcaagcaa	420
caggtgcaag	tggtgggggc	ttgcaggaac	atctggntaa	ctctgcttga	tgatggcant	480
caagatgata	gacatgggca	gcgcctgcag	a			511

<213> Homo sapien

tccgaattc	aagcgacaaa	ttggawagt	aaatggaaga	tgcctatcat	gaacatcagg	60
caaatctttt	gcgccaaagt	ctgatgagac	gacaggaaga	attaagacgc	atggaagaac	120
ttcacaatca	agaaatgcag	aaacgtaaag	aaatgcaatt	gaggcaagag	gaggaacgac	180
gtagaagaga	ggaagagatg	atgatctgtc	aacgtgagat	ggaagaacaa	atgaggcgcc	240
aaagagagga	aagttacagc	cgaatgggct	acatggatcc	acgggaaaaga	gacatgcgaa	300
tgggtggcgg	aggagcaatg	aacatgggag	atccctatgg	ttcaggagggc	cagaaatttc	360

cacctctagg	aggtggtggt	ggcatagggt	atgaagctaa	tcttggcggt	ccaccagcaa	420
ccatgagtgg	ttccatgatg	ggaagtgaca	tgcgtagtga	gcgctttggg	cagggaggtg	480
cggggcctgt	gggtggacag	ggctctagag	gaatggggcc	tggaactcca	gcaggatatg	540
gtagagggag	agaagagtac	gaaggg				566

<210> 152

<211> 518

<212> DNA

<213> Homo sapien

<400> 152

ttcgtgaaga	ccctgactgg	taagaccatc	actctcgaag	tggagcccga	gtgacaccat	60
tgagaatgtc	aaggcaaaga	tccaagacaa	ggaaggcatc	cctcctgacc	agcakaggtt	120
gatctttgct	gggaaacagc	tggaagatgg	acgcaccctg	tctgactaca	acatccagaa	180
agagtccacc	ctgcacctgg	tgctccgtct	cagaggtggg	atgcaaactc	tctggaagac	240
cctgactggt	aagaccatca	ccctcgaggt	ggagcccagt	gacaccatcg	agaatgtcaa	300
ggcaaagatc	caagataagg	aaggcatccc	tcttgatcag	cagaggttga	tctttgctgg	360
gaaacagctg	gaagatggac	gcaccctgtc	tgactacaac	atccagaaag	agtccactct	420
gcacttggtc	ctgcgcttga	gggggggtgt	ctaagtttcc	ccttttaagg	tttcaacaaa	480
tttcattgca	ctttcctttc	aataaagttg	ttgcattc			518

<210> 153

<211> 542

<212> DNA

<213> Homo sapien

<400> 153

gcgcgggtgc	gtgggccact	gggtgaccga	cttagcctgg	ccagactctc	agcacctgga	60
agcgcgccga	gagtgcacgc	gtgaggctgg	gagggaggac	ttggcttgag	cttggttaaac	120
tctgctctga	gcctccttgt	cgctgcatt	tagatggctc	ccgcaaagaa	gggtggcgag	180
aagaaaaagg	gccgttctgc	catcaacgaa	gtggttaacc	gagaatacac	catcaacatt	240
cacaagcgca	tccatggagt	gggcttcaag	aagcgtgcac	ctcgggcact	caaagagatt	300
cggaaatttg	ccatgaagga	gatgggaact	ccagatgtgc	gcattgacac	caggctcaac	360
aaagctgtct	gggcccagg	aataaggaat	gtgccatacc	gaatccgtgt	gcggctgtcc	420
agaaaacgta	atgaggatga	agattcacca	aataagctat	atactttggt	tacctatgta	480
cctgttacca	ctttcaaaaa	tctacagaca	gtcaatgtgg	atgagaacta	atcgctgac	540
gt						542

<210> 154

<211> 411

<212> DNA

<213> Homo sapien

<400> 154

aattctttat	ttaaataaac	aaactcatct	tcttcaagcc	ccagaccatg	gtaggcagcc	60
ctccctctcc	atccctcac	cccaccctt	agccacagtg	aagggaatgg	aaaatgagaa	120
gccacgaggg	cccctgccag	ggaaggctgc	cccagatgtg	tggtgagcac	agtcagtgca	180
gctgtggctg	gggcagcagc	tgccacaggc	tcttccctat	aaattaagtt	cctgcagcca	240
cagctgtggg	agaagcatac	ttgtagaagc	aaggccagtc	cagcatcaga	aggcagaggg	300
agcatcagtg	actcccagcc	atggaatgaa	cggaggacac	agagctcaga	gacagaacag	360
gccaggggga	agaaggagag	acagaatagg	ccagggcagc	gcggtgaggg	a	411

<211> 936
 <212> DNA
 <213> Homo sapien

<400> 161

taattttotta	gtcgttttga	atccttaago	atgcaaaagc	tttgaacaga	agggttcaca	60
aaggaaccag	ggttgtctta	tggcatccag	ttaagccaga	gctgggaatg	cctctgggtc	120
atccacatca	ggagcagaag	cacttgactt	gtcggtcctg	ctgccacggg	ttgggcgccc	180
accacgccc	cgtccacctc	gtcctcccc	gccgccacgt	cctgggcggc	caaggctccc	240
aaaattgatc	tccagctgag	acgttatatc	atgtgctggc	ttccggaaat	gatgggtccat	300
aaccgaatct	tcagcatgag	cctcttcact	ctttgattta	tgaagaacaa	atcccttctt	360
ccactgccc	tcagcacctt	catttggttt	tgggatatta	aattctactt	ttgcccgggc	420
cttattttga	atagccttcc	actcatccaa	agtcactctt	tttggaccct	cctctttttac	480
ctcttcaact	tcattctcct	tattttcagt	gtctgccact	ggatgatgtt	cttcaccttc	540
aggtgtttcc	tcagtcacat	ttgattgatc	caagtcagtt	aattcgtctt	tgacagttcc	600
ccagttgtga	gatccgctac	ctccacgttt	gtcctcgtgc	ttcaggccag	atctatcact	660
tccactatgc	ctatcaaatt	caggtttgcc	acgagaatca	aatccatctc	ctcggcccat	720
tccagtcoca	cggccccctc	gacctcttcc	aagaccacca	cgacctcgaa	taggtcgggc	780
aataatcggt	ctatcaactg	aaaattcgcc	tccttcaccc	ttttcttcaa	gtggcttttc	840
gaatcttcgt	tcacgaggtg	gtcgcctttc	tggctcttca	tcaattattt	tccttccacc	900
ctgaagttgt	tgatcaggtc	ttcttccaac	tctgtgc			936

<210> 162
 <211> 950
 <212> DNA
 <213> Homo sapien

<400> 162

aagcggatgg	acctgagtca	gccgaatcct	agcccccttc	cttgggcctg	ctgtggtgct	60
cgacatcagt	gacagacgga	agcagcagac	catcaaggct	acgggaggcc	cggggcgctt	120
gcgaagatga	agtttggtcg	cctctccttc	cggcagcctt	atgctggctt	tgtcttaaat	180
ggaatcaaga	ctgtggagac	gcgctggcgt	cctctgctga	gcagccagcg	gaactgtacc	240
atcgccgtcc	acattgctca	cagggactgg	gaaggcgatg	cctgtcggga	gctgctggtg	300
gagagactcg	ggatgactcc	tgtcagatt	caggccttgc	tcaggaaagg	ggaaaagttt	360
ggtcgaggag	tgatagcggg	actcgttgac	attggggaaa	ctttgcaatg	ccccgaagac	420
ttaactccc	atgaggttgt	ggaactagaa	aatcaagctg	cactgaccaa	cctgaagcag	480
aagtacctga	ctgtgatttc	aaaccccagg	tggttactgg	agcccatacc	taggaaagga	540
ggcaaggatg	tattccaggt	agacatccca	gagcacctga	tccctttggg	gcatgaagtg	600
tgacaagtgt	gggctcctga	aaggaatggt	ccrgagaaac	cagctaaatc	atggcacctt	660
caatttgcca	tcgtgacgca	gacctgtata	aattagggtta	aagatgaatt	tccactgctt	720
tggagagtcc	caccactaa	gcactgtgca	tgtaaacagg	ttcctttgct	cagatgaagg	780
aagtaggggg	tggggctttc	cttgtgtgat	gcctccttag	gcacacaggc	aatgtctcaa	840
gtactttgac	cttagggtag	aaggcaaaagc	tgccagtaaa	tgtctcagca	ttgctgctaa	900
ttttggctct	gctagtttct	ggattgtaca	aataaatgtg	ttgtagatga		950

<210> 163
 <211> 475
 <212> DNA
 <213> Homo sapien

<220>

<400> 163

<210> 164

<211> 476

<212> DNA

<213> Homo sapien

<400> 164

<210> 165

<211> 256

<212> DNA

<213> Homo sapien

<220>

<221> misc feature

 $\langle 222 \rangle \quad (1) \dots (256)$

<223> n = A, T, C or G

<400> 165

<210> 166

<211> 332

<212> DNA

<213> Homo sapien

<400> 166

```

agcgtggtcg cggccgaggt caagaacccc gcccgcacct gccgtgacct caagatgtgc      60
cactctgact ggaagagtgg agagtactgg attgaccca accaaggctg caacctggat      120
gccatcaaag tcttctgcaa catggagact ggtgagacct gcgtgtaccc cactcagccc      180
agtgtggccc agaagaactg gtacatcagc aagaaccca aggacaagag gcatgtctgg      240
ttcggcgaga gcatgaccga tggattccag ttcgagtatg gcggccaggg ctccgaccct      300
gccgatgtgg acctgcccg gcgcccgctc ga                                     332

```

<210> 167

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (332)

<223> n = A,T,C or G

<400> 167

```

tcgagcggtc gcccgggcag gtccacatcg gcagggtcgg agccctggcc gccatactcg      60
aactggaatc catcggnat gctctcgccg aaccagacat gcctcttgnc cttggggttc      120
ttgctgatgt accagntctt ctggggcaca ctgggctgag tggggtacac gcagggtctca      180
ccantctcca tgttgcanaa gactttgatg gcatccaggt tgcagccttg gttgggggtca      240
atccagtact ctccactctt ccagacagag tggcacatct tgaggtcacg gcagggtgcgg      300
gcgggggttct tgacctcggt cgcgaccacg ct                                     332

```

<210> 168

<211> 276

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (276)

<223> n = A,T,C or G

<400> 168

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tcgagcggcc gcccgggcag gtccctctca gagcggtagc tgttcttatt gccccggcag      60
cctccataga tnaagttatt gcangagttc ctctccacgt caaagtacca gcgtgggaag      120
gatgcacggc aaggccaggt gactgcgttg gcggtgcagt attcttcata gttgaacata      180
tcgctggagt ggacttcaga atcctgcctt ctgggagcac ttgggacaga ggaatccgct      240
gcattcctgc tgggtggacct cggccgcgac cacgct                                     276

```

<210> 169

<211> 276

<212> DNA

<213> Homo sapien

<400> 169

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agcgtggtcg cggccgaggt ccaccagcag gaatgcagcg gattcctctg tcccaagtgc      60
tcccagaagg caggattctg aagaccactc cagcgatatg ttcaactatg aagaatactg      120

```

caccgccaac	gcagtcactg	ggccttgccg	tgcatacttc	ccacgctggg	actttgacgt	180
ggagaggaac	tcttgaata	acttcatcta	tggaggctgc	cggggcaata	agaacagcta	240
ccgctctgag	gaggacctgc	ccgggcgggc	gctcga			276

<210> 170

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(332)

<223> n = A,T,C or G

<400> 170

tcgagcggcc	gcccgggcag	gtccacatcg	gcagggtcgg	agccctggcc	gccatactcg	60
aactggaatc	catcgggtcat	gtctctgccg	aaccagacat	gcctcttgtc	cttgggggttc	120
ttgctgatgt	accagttctt	ctggggccaca	ctgggctgag	tgggggtacac	gcagggtctca	180
ccagtctcca	tgttgcagaa	gactttgatg	gcatccaggt	tgcagccttg	gttgggggtca	240
atccagtact	ctccactctt	ccagccagaa	tggcacatct	tgagggtcacg	gcangtgccg	300
gcgggggttct	tgacctcggc	cgcgaccacg	ct			332

<210> 171

<211> 333

<212> DNA

<213> Homo sapien

<400> 171

agcgtggtcg	cggccgaggt	caagaaaccc	cgcgcgcacc	tgccgtgacc	tcaagatgtg	60
ccactctggc	tgggaagagt	gagagtactg	gattgacccc	aaccaaggct	gcaacctgga	120
tgccatcaaa	gtcttctgca	acatggagac	tgggtgagacc	tgccgtgtacc	ccactcagcc	180
cagtgtggcc	cagaagaact	ggtacatcag	caagaacccc	aaggacaaga	ggcatgtctg	240
gctcggcgag	agcatgaccg	atggattcca	gttcgagtat	ggcggccagg	gctccgaccc	300
tgccgatgtg	gacctgcccg	ggcggccgct	cga			333

<210> 172

<211> 527

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(527)

<223> n = A,T,C or G

<400> 172

agcgtggtcg	cggccgaggt	cctgtcagag	tggcactggg	agaagntcca	ggaaccctga	60
actgtaaggg	ttcttcatca	gtgccaacag	gatgacatga	aatgatgtac	tcagaagtgt	120
cctgnaatgg	ggcccatgan	atggttgnc	gagagagagc	ttcttgctct	acattcggcg	180
ggtatggtct	tggcctatgc	cttatggggg	tggccgttgn	gggcggtgng	gtccgcctaa	240
aaccatgttc	ctcaaagatc	atttgttgcc	caacactggg	ttgctgacca	naagtgccag	300

```
<210> 173
<211> 635
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(635)
<223> n = A,T,C or G
```

```
<210> 174
<211> 572
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(572)
<223> n = A,T,C or G
```

<210> 175

<211> 372
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(372)
 <223> n = A,T,C or G

<400> 175
 agcgtggtcg cggccgaggt cctcaccaga ggtaccacct acaacatcat agtggaggca 60
 ctgaaaagacc agcagaggca taagggttcgg gaagagggtg ttaccgtggg caactctgtc 120
 aacgaaggct tgaaccaacc tacggatgac tcgtgctttg acccctacac agtttcccat 180
 tatgccgttg gagatgagtg ggaacgaatg tctgaatcag gctttaaact gttgtgccag 240
 tgcttanget ttggaagtgg tcatttcaga tgtgattcat ctagatgggtg ccatgacaat 300
 ggtgtgaact acaagattgg agagaagtgg gaccgtcagg gagaaaatgg acctgcccgg 360
 gcggccgctc ga 372

<210> 176
 <211> 372
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(372)
 <223> n = A,T,C or G

<400> 176
 tcgagcggcc gcccgggcag gtccattttc tccctgacgg tcccacttct ctccaatctt 60
 gtagttcaca ccattgtcat ggcaccatct agatgaatca catctgaaat gaccacttcc 120
 aaagcctaag cactggcaca acagtttaaa gcctgattca gacattcgtt cccactcatc 180
 tccaacggca taatgggaaa ctgtgtaggg gtcaaagcac gagtcatccg taggttggtt 240
 caagccttcg ntgacagagt tgcccacggg aacaacctct tcccgaacct tatgcctctg 300
 ctggtctttc agtgctcca ctatgatgtt gtaggtggta cctctggtga ggacctcggc 360
 cgcgaccacg ct 372

<210> 177
 <211> 269
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(269)
 <223> n = A,T,C or G

<400> 177
 agcgtggccg cggccgaggt ccattggctg gaacggcatc aacttggaag ccagtgatcg 60
 tctcagcctt ggttctccag ctaatgggtga tggnggtctc agtagcatct gtcacacgag 120
 cccttcttgg tgggctgaca ttctccagag tgggtgacaac accctgagct ggtctgcttg 180

```
<210> 178
<211> 529
<212> DNA
<213> Homo sapien
```

```
<210> 179
<211> 454
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1) ... (454)
<223> n = A,T,C or G
```

```
<210> 180
<211> 454
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(454)
<223> n = A,T,C or G
```

<400> 180
tcgagcgcggcc gcccgggcag gtctgccag cccccattgg cgagtttgag aaggngtgca 60

```
<210> 181
<211> 102
<212> DNA
<213> Homo sapien
```

```

      <400> 181
agcgtggntg cggacgacgc ccacaaagcc attgtatgta gttttanttc agctgcaaan      60
aataccncca gcatccacct tactaaccag catatgcaga ca                               102

```

```
<210> 182
<211> 337
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(337)
<223> n = A,T,C or G
```

<400> 182						
tcgagcgggtc	gcccgggcag	gtctggggcgg	atagcaccgg	gcatattttg	gaatggatga	60
ggctctggcac	cctgagcagc	ccagcgagga	cttggctcta	gttgagcaat	ttggctagga	120
ggatagtatg	cagcacgggt	ctgagtctgt	gggatatctg	ccatgaagna	acctgaagga	180
ggcgctggct	ggtanggggt	gattacaggg	ctgggaacag	ctcgtacact	tgccattctc	240
tgcataact	ggntagtgag	gcgagcctgg	cgctcttctt	tgcgctgagc	taaagctaca	300
tacaatggct	ttgnnggacct	cggccgcgac	cacgctt			337

```
<210> 183
<211> 374
<212> DNA
<213> Homo sapien
```

<400> 183						
tcgagcggcc	gcccgggcag	gtccattttc	tccttgacgg	tcccacttct	ctccaatott	60
gtagtgcaca	ccattgtcat	gacaccatct	agatgaatca	catctgaaat	gaccacttcc	120
aaagcctaag	cactggcaca	acagtttaaa	gcttgattca	gacattcggt	cccatctatc	180
tccaacggca	taatgggaaa	ctgtgtaggg	gtcaaagcac	gagtcatccg	taggttggtt	240
caagccttcg	ttgacagaaq	ttgcccacgg	taacaacctc	ttcccgaaac	ttatgcctct	300

gctgggtcttt caagtgcctc cactatgatg ttgtagggtgg cacctctggt gaggacctcg 360
gcccgcacca cgct 374

<210> 184
<211> 375
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

<400> 184
agcgtgggttt gcgcccgagg tcctcaccan aggtgccacc tacaacatca tagtggagggc 60
actgaaagac cagcagagggc ataagggttcg ggaagagggt gttaccgtgg gcaactctgt 120
caacgaaggc ttgaaccaac ctacggatga ctctgtcttt gacccttaca cagnttccca 180
ttatgccgtt ggagatgagt ggggaacgaat gtctgaatca ggcttttaaac tgttgtgcca 240
gtgcttange tttggaagtg gtcatttcag atgtgattca tctanatggg gtcattgacaa 300
tgggtngaac tacaagattg gagagaagtg gnaccgtcag ggganaaaat ggacctgccc 360
ggcgccgncg ctgca 375

<210> 185
<211> 148
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(148)
<223> n = A,T,C or G

<400> 185
agcgtgggtcg cggcccgagg ctggcttncg gctcangtga ttatcctgaa ccatccaggc 60
caaataagcg ccggctatgc ccctgnattg gattgccaca cggctcacat tgcattgcaag 120
tttgctgagc tgaaggaaaa gattgatc 148

<210> 186
<211> 397
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(397)
<223> n = A,T,C or G

<400> 186
tcgagcggcc gcccgggcag gtccaattga aacaaacagt tctgagaccg ttcttccacc 60
actgattaag agtggggngg cgggtattag ggataatatt catttagcct tctgagcttt 120
ctgggcagac ttggtgacct tgccagctcc agcagccttc tgggtccactg ctttcatgac 180

05636501.034000

acccaccgca	actgtctgtc	tcatatcacg	aacagcaaag	cgacccaaag	gtggatagtc	240
tgagaagctc	tcaacacaca	tgggcttgcc	aggaaccata	tcaacaatgg	gcagcatcac	300
cagacttcaa	gaattttaagg	gccatcttcc	agctttttac	cagaacggcg	atcaatcttt	360
tccttcagct	cagcaaactt	gcatgcaatg	tgagccg			397

<210> 187

<211> 584

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(584)

<223> n = A,T,C or G

<400> 187

tcgagcggcc	gcccgggcag	gtccagaggg	ctgtgctgaa	gtttgctgct	gccactggag	60
ccactccaat	tgctggccgc	ttcactcctg	gaaccttcac	taaccagatc	caggcagcct	120
tccgggagcc	acggcttctt	gtggntactg	accccagggc	tgaccaccag	cctctcacgg	180
aggcattctta	tgttaaccta	cctaccattg	cgctgtgtaa	cacagattct	cctctgcgct	240
atgtggacat	tgccatccca	tgcaacaaca	agggagctca	ctcagngggg	tttgatgtgg	300
tggatgctgg	ctcgggaagt	tctgcgcatg	cgtggcacca	tttcccgtga	acacccatgg	360
gangncatgc	ctgatctgga	cttctacaga	gacctgaag	agattgaaaa	agaagaacag	420
gctgnttgct	ganaaagcaa	gtgaccaagg	angaaatttc	angggtgaaa	nggactgctc	480
ccgctcctga	attcactgct	actcaacctg	angntgcaga	ctgggtcttg	aggngnacac	540
gggcccctctg	ggcctattta	agcancttcg	gtcgcgaaca	cgnt		584

<210> 188

<211> 579

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(579)

<223> n = A,T,C or G

<400> 188

agcgtgngtc	gcggccgagg	tgctgaatag	gcacagaggg	cacctgtaca	ccttcagacc	60
agtctgcaac	ctcaggctga	gtagcagtga	actcaggagc	gggagcagtc	cattcacccct	120
gaaattcctc	cttggncaact	gccttctcag	cagcagcctg	ctcttctttt	tcaatctctt	180
caggatctct	gtagaagtac	agatcaggca	tgacctccca	tgggtgttca	cgggaaatgg	240
tgccacgcat	gcgcagaact	tcccagagcca	gcatccacca	catcaaacc	actgagttag	300
ctcccttggt	gttgcatggg	atgggcaatg	tccacatagc	gcagaggaga	atctgtgtta	360
cacagcgcaa	tggtaggtag	gttaacataa	gatgcctccg	cgagaagctg	gtggtcagcc	420
ctgggggtcaa	gtaaccacaa	gaagccgtgg	ctcccgaag	gctgcctgga	tctggttagt	480
gaaggntcca	ggagtgaagc	ggccaacaat	tggagtggct	tcagtggcaa	gcagcaaact	540
tcagcacaag	ccctctggac	ctgcccggcg	gccgctcga			579

<210> 189

<211> 374

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(374)
<223> n = A,T,C or G

<400> 189
tcgagcggcc gcccgggcag gtccattttc tccctgacgg ncccacttct ctccaatctt 60
gtagttcaca ccattgtcat ggcaccatct agatgaatca catctgaaat gaccacttcc 120
aaagcctaag cactggcaca acagttttaa gcctgattca gacattcgtt cccactcatc 180
tccaacggca taatgggaaa ctgtgtaggg gtcaaagcac gagtcacccg taggttggtt 240
caagccttcg ttgacagagt tgcccacggg aacaacctcn tccccgaacc ttatgcctct 300
gctgggcttt cagngcctcc actatgatgn tgtagggggg cacctctggn gangacctcg 360
gccgcgacca cgct 374

<210> 190
<211> 373
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(373)
<223> n = A,T,C or G

<400> 190
agcgtgggtcg cggccgaggt cctcaccaga ggtgccacct acaacatcat agtggaggca 60
ctgaaagacc agcagaggca taaggctcgg gaagagggtg ttaccgtggg caactctgtc 120
aacgaaggct tgaaccaacc tacggatgac tcgtgctttg acccctacac agtttcccat 180
tatgccgttg gagatgagtg ggaacgaatg tctgaatcag gctttaaact gttgtgccag 240
tgcttangct ttggaagtgg gtcatttcag atgtgattca tctagatggg gccatgacaa 300
tggngngaac tacaagattg gagagaagtg gnaccgncag ggagaaaatg gacctgcccg 360
ggcggccgct cga 373

<210> 191
<211> 354
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(354)
<223> n = A,T,C or G

<400> 191
agcgtgggtcg cggccgaggt ccacatcggc agggtcggag ccctggccgc catactcgaa 60
ctggaatcca tcggatcatgc tctcgccgaa ccagacatgc ctcttgctct tgggggttctt 120
gctgatgtac cagttcttct gggccacact gggctgagtg gggtagacgc aggtctcacc 180
agtctccatg ttgcagaaga ctttgatggc atccaggntg caaccttggt tgggggtcaat 240

ccagtactct ccactcttcc agccagagtg gcacatcttg aggtcacggc aggtgcggnc 300
 gggggntttt gcggctgccc tctggncctc ggntgtntct natctgctgg ctca 354

<210> 192
 <211> 587
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(587)
 <223> n = A,T,C or G

<400> 192
 tcgagcggcc gcccgggcag gtctcgcggt cgcactgggt atgctgggtc tgttgggtccc 60
 cccggccctc ctggacctcc tggccccctt ggtcctccca gcgctgggtt cgacttcagc 120
 ttctgcccc agccacctca agagaaggct cagcatgggt gccgctacta ccgggctgat 180
 gatgccaatg tggttcgtga cctgacctc gaggtggaca ccacctcaa gaggctgagc 240
 cagcagatcg agaacatccg gagcccagag ggcagncgca agaaccctgc ccgcacctgc 300
 cgtgacctca agatgtgcca ctctgactgg aagagtggag agtactggat tgaccccaac 360
 caagctgcaa cctggatgcc atcaaagtct tctgcaacat ggagactggg gagacctgcg 420
 tgtacccac tcagcccagt gtggcccaaa agaactggta catcagcaag aaccccaagg 480
 acaagaagca tgtctgggtc ggcgagaaca tgaccgatgg attccagttc gagtatggcg 540
 ggcagggctc cgacctgcc gatggggacc ttggccgcga acacgt 587

<210> 193
 <211> 98
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(98)
 <223> n = A,T,C or G

<400> 193
 agcgtgggng cggccgaggt ataaatatcc agnccatctc ctccctccac acgtganag 60
 atgaagctgt ncaaagatct cagggtggan aaaaccat 98

<210> 194
 <211> 240
 <212> DNA
 <213> Homo sapien

<400> 194
 tcgagcggcc gcccgggcag gtccttcaga cttggactgt gtcacactgc caggcttcca 60
 gggctccaac ttgcagacgg cctgttggtg gacagtctct gtaatcgga aagcaaccat 120
 ggaagacctg ggggaaaaca ccatggtttt atccaccctg agatctttga acaacttcat 180
 ctctcagcgt gcggaggag gctctggact ggatatttct acctcggccg cgaccacgct 240

<210> 195

```
<220>
<221> misc_feature
<222> (1)...(400)
<223> n = A,T,C or G
```

```
<210> 196
<211> 494
<212> DNA
<213> Homo sapien
```

```
<210> 197
<211> 118
<212> DNA
<213> Homo sapien
```

```

<220>
<221> misc_feature
<222> (1)...(118)
<223> n = A,T,C or G

<400> 197
agcgtggnccg cggccgaggt gcagcgcggg ctgtgccacc ttctgctctc tqcccaacqa
60

```

```
<210> 198
<211> 403
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(403)
<223> n = A,T,C or G
```

```
<210> 199
<211> 167
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(167)
<223> n = A,T,C or G
```

```
<210> 200
<211> 252
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(252)
<223> n = A,T,C or G
```

<400>	200					
tcgagcgggtt	cgccccgggca	ggtccaccac	acccaattcc	ttgctggtat	catggcagcc	60
gccacgtgcc	aggattaccg	gctacatcat	caagtatgag	aagcctgggt	ctcctcccag	120
agaagcggtc	cctcgcccc	gccctggtgt	cacagaggct	actattactg	gcctggaacc	180
gggaaccgaa	tatacaattt	atgtcattgn	cctgaagaat	aatcannaan	agcqancccc	240

252

<400> 201

<210> 202

$\langle 220 \rangle$

<400> 202

<210> 203

<400> 203

<210> 204

<400> 204

tcgagcggcc	gcccgggcag	gtcctgtcag	agtggcactg	gtagaagttc	caggaaccct	60
gaactgtaag	ggttcttcat	cagtgccaac	aggatgacat	gaaatgatgt	actcagaagt	120


```
<210> 210
<211> 872
<212> DNA
<213> Homo sapien
```

```
<220>  
<221> misc_feature  
<222> (1)...(872)  
<223> n = A,T,C or G
```

```
<210> 211
<211> 517
<212> DNA
<213> Homo sapien
```

```
<220>  
<221> misc_feature  
<222> (1) ... (517)  
<223> n = A,T,C or G
```

<400> 211						
tcgagcggcc	gcccgggcag	gtctgccaag	gagacctgt	tatgctgtgg	ggaactggctg	60
gggcatggca	ggcggtctctg	gcttccacc	cttctgttct	gagatggggg	tgggtgggcag	120
tatctcatct	ttgggttcca	caatgctcac	gtggtcaggc	aggggcttct	tagggccaat	180
cttaccagtt	gggtcccagg	gcagcatgat	cttcacctg	atgccagca	cacctgtct	240
gagcaaacg	tggcgcaaa	gcagtgtcaa	cgtagtaagt	taacagggtc	tccgctgtgg	300
atcatcaggc	catccacaaa	cttcatggat	ttagccctct	gtcctcggag	tttcccagac	360
accacaacct	cgcagccttt	ggccccactc	tccatgatga	accgcagcac	accatagcag	420
gccctccgca	caagcaagcc	ctcctaagaa	tttgtaacgc	ananactctg	ctggcaatgg	480
cacacaaaacc	tctaqtqqac	ctcggncgcg	accacgc			517

```
<220>  
<221> misc_feature  
<222> (1)...(695)  
<223> n = A,T,C or G
```

```
<210> 213
<211> 804
<212> DNA
<213> Homo sapien
```

<400> 213						
agcgtgggtcg	cggccgaggt	gttttatgac	gggcccggtg	ctgaaggggca	gggaacaact	60
tgatggtgct	actttgaact	gcttttcttt	tctccttttt	gcacaaaagag	tctcatgtct	120
gatatttaga	catgatgagc	tttgtgcaa	aggggagctg	gctacttctc	gctctgcttc	180
atcccactat	tattttggca	caacaggaag	ctgttgaaag	aggatgttcc	catcttggtc	240
agtcctatgc	ggatagagat	gtctggaagc	cagaaccatg	ccaaatatgt	gtctgtgact	300
caggatccgt	tctctgcgat	gacataatat	gtgacgatca	agaattagac	tgccccaacc	360
cagaaattcc	atttgagaa	tgttgtgcag	tttgcccaca	gctccaact	gctcctactc	420
gccctcctaa	tggtcaagga	cctcaaggcc	ccaagggaga	tccaggccct	cctggtattc	480
ctgggagaaa	tggtgacct	ggtattccag	gacaaccagg	gtcccctggg	tctcctggcc	540
cccctggaat	cngngaatc	atgccctact	ggctctcaa	ctattctccc	anatgattca	600
tatgatgtca	agtctgggat	agcnagtang	ganggactcg	caggctattc	tggaccanac	660
ctgccggggg	ggcgttcgaa	agcccgaatc	tgcananntn	cnttcacact	ggcggcgcgc	720
gagctgcttt	aaaaggggcca	ttcnccttt	agnngggggg	antacaatta	ctnggcggcg	780
ttttanancg	cgngnctggg	aaat				804

```
<220>
<221> misc_feature
<222> (1)...(594)
<223> n = A,T,C or G
```

```
<210> 215
<211> 590
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(590)
<223> n = A,T,C or G
```

```
<210> 216
<211> 801
<212> DNA
<213> Homo sapien
```

```
<220>  
<221> misc_feature  
<222> (1)...(801)
```

<223> n = A,T,C or G

<400> 216

tngagcggcc	gcccgggcag	gntgnnaacg	ctggtcctgc	tggtcctcct	ggcaaggctg	60
gtgaagatgg	tcaccctgga	aaacccggac	gacctggtga	gagaggagtt	gttggaccac	120
aggggtgctcg	tggtttccct	ggaactcctg	gacttcctgg	cttcaaaggc	attaggggac	180
acaatggtct	ggatggattg	aaggacagc	ccggtgctcc	tggtgtgaag	ggtgaacctg	240
gtgcccctgg	tgaaaatgga	actccaggtc	aaacaggagc	ccgtgggctt	cctggtgaga	300
gaggaccctg	ttggtgcccc	tgcccanac	ctcgcccgcg	accacgctaa	gcccgaattt	360
ccagcacact	ggnggccgtt	actantggat	ccgagctcgg	taccaagctt	ggcgtaatca	420
tggtcatagc	tgtttcctgn	gtgaaattgt	tatccgctca	caatttcaca	cancatacga	480
agccggaaaag	cataaagtgt	aaagccttgg	ggtgctaata	agtgaagctaa	ctcncattaa	540
attgcgttgc	gctcactgcc	cgcttttcca	nnngggaaaac	cntggcntng	ccngcttgcg	600
ttaantgaaa	tccgccnacc	cccggggaaa	agncggtttg	cngtattggg	gcnccttttc	660
cctttcctcg	gnttacttga	nttantgggc	tttggncgnt	tcgggttgng	gcgancnggt	720
tcaacntcac	nccaaaggng	gnaanacggt	tttcccanaa	tccgggggnt	ancccaangn	780
aaaacatnng	ncnaangggc	t				801

<210> 217

<211> 349

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(349)

<223> n = A,T,C or G

<400> 217

agcgtggttn	gcggccgagg	tctgggccag	gggcaccaac	acgtcctctc	tcaccaggaa	60
gccacgggc	tctgtttga	cctggagttc	cattttcacc	aggggcacca	ggttcacct	120
tcacaccagg	agcaccgggc	tgtcccttca	atccatncag	accattgtgn	cccctaata	180
ctttgaagcc	aggaagtcca	ggagttccag	ggaaaccacc	gagcaccctg	tggtccaaca	240
actcctctct	caccaggctcg	tccgggtttt	ccagggtgac	catcttcacc	agccttgcca	300
ggaggaccag	caggaccagc	gttaccaccc	tgcccgggcg	gccgctcga		349

<210> 218

<211> 372

<212> DNA

<213> Homo sapien

<400> 218

tcgagcggcc	gcccgggcag	gtccattttc	tccttgacgg	tcctcattct	ctccaattct	60
gtagttcaca	ccattgtcat	ggcaccatct	agatgaatca	catctgaaat	gaccacttcc	120
aaagcctaag	cactggcaca	acagtttaaa	gcctgattca	gacattcggt	cccactcatc	180
tccaacggca	taatgggaaa	ctgtgtaggg	gtcaaagcac	gagtcacccg	taggttggtt	240
caagccttcg	ttgacagagt	tgccacgggt	aacaacctct	tcctgaacct	tatgcctctg	300
ctggtctttc	agtgcctcca	ctatgatgtt	gtaggtggca	cctctggtga	ggacctcggc	360
cgcgaccacg	ct					372

<210> 219

<400> 219

```
<220>
<221> misc_feature
<222> (1)...(828)
<223> n = A,T,C or G
```

<400> 220

<400> 221

tcgagcgggcc	gcccgggcag	gtgtcggagt	ccagcacggg	aggcgtggtc	ttgtagttgt	60
tctccggctg	cccattgctc	tcccactcca	cggcgatgtc	gctgggtag	aagcctttga	120
ccaggcaggt	caggetgacc	tggttcttgg	tcatctcctc	ccgggatggg	ggcagggtgt	180
acacctgtgg	ttctcggggc	tgccttttgg	ctttggagat	ggttttctcg	atgggggctg	240
ggagggcctt	gttggagacc	ttgcacttgt	actccttgcc	attcagccag	tcctggtgca	300
ggacggtgag	gacgetgacc	acacggtacg	tgctgttgta	ctgctcctcc	cgcggtcttg	360

tcttggcatt atgcacctcc acgccgtcca cgtaccagtt gaacttgacc tcagggctctt 420
cgtggctcac gtccaccacc acgcatgtaa cctcagacct cggccgcgac cacgct 476

<210> 222
<211> 477
<212> DNA
<213> Homo sapien

<400> 222
agcgtggtcg cggccgaggt ctgaggttac atgcgtggtg gtggacgtga gccacgaaga 60
ccctgaggtc aagttcaact ggtacgtgga cggcgtggag gtgcataatg ccaagacaaa 120
gccgcgggag gagcagtaca acagcacgta cegtgtggtc agcgtcctca ccgtcctgca 180
ccaggactgg ctgaatggca aggagtacaa gtgcaaggtc tccaacaaaag ccctcccagc 240
ccccatcgag aaaaccatct ccaaagccaa agggcaagcc ccgagaacca caggtgtaca 300
ccctgcccc atcccgagg gagatgacca agaaccaggt cagcctgacc tgcctgggtca 360
aaggcttcta tcccagcgac atcgccgtgg agtgggagag caatgggcag ccggagaaca 420
actacaagac cagcctccc gtgctggact ccgacacctg cccgggcggc cgctcga 477

<210> 223
<211> 361
<212> DNA
<213> Homo sapien

<400> 223
tcgagcggcc gcccgggcag gttgaatggc tcctcgtgta ccaccccggt gctggtggtg 60
ggtacagagc tccgatgggt gaaaccattg acatagagac tgtccctgtc caggggtgtag 120
gggcccagct cagtgatgcc gtgggtcagc tggctcagct tccagtacag ccgtctctctg 180
tccagtccag ggcttttggg gtcaggacga tgggtgcaga cagcateccac tctggtggct 240
gccccatcct tctcaggcct gagcaaggtc agtctgcaac cagagtacag agagctgaca 300
ctggtgttct tgaacaaggg cataagcaga cctgaagga cacctcggcc gcgaccacgc 360
t 361

<210> 224
<211> 361
<212> DNA
<213> Homo sapien

<400> 224
agcgtggtcg cggccgaggt gtccttcagg gtctgcttat gcccttggtc aagaacacca 60
gtgtcagctc tctgtactct ggttgacagc tgacctgtc caggcctgag aaggatgggg 120
cagccaccag agtggatgct gtctgcaccc atcgctctga ccccaaaagc cctggactgg 180
acagagagcg gctgtactgg aagctgagcc agctgaccca cggcatcact gagctggggc 240
cctacaccct ggacagggac agtctctatg tcaatggttt caccatcgg agctctgtac 300
ccaccaccag caccggggtg gtcagcgagg agccattcaa cctgcccggg cggccgctcg 360
a 361

<210> 225
<211> 766
<212> DNA
<213> Homo sapien

<223> n = A, T, C or G

agcgtggtcg	cggccgaggt	cctgtcagag	tggcactggt	agaagtcca	ggaaccctga	60
actgtaaggg	ttcttcacatca	gtgccaacag	gatgacatga	aatgatgtac	tcagaagtgt	120
cctggaatgg	ggcccatgag	atggttgtct	gagagagagc	ttcttgtcct	acattcggcg	180
ggtatggtct	tggcctatgc	cttatggggg	tggccgttgt	gggcggtgtg	gtccgcctaa	240
aaccatgttc	ctcaaagatc	atgtgttgcc	caacactggg	ttgctgacca	gaagtgcacg	300
gaagctgaat	accatttcca	gtgtcatacc	cagggtgggt	gacgaaaggg	gtcttttgaa	360
ctgtggaagg	aacatccaag	atctctggtc	catgaagatt	ggggtgtgga	agggttacca	420
gttgggggaag	ctcgtctgtc	tttttccttc	caatcagggg	ctcgctcttc	tgattattct	480
tcagggcaat	gacataaatt	gtatatctcg	tcccgttcc	aggccagtaa	tagtagcctc	540
tgtgacacca	gggcggggcc	gagggaccct	tctnttgga	gagaccagct	tctcatactt	600
gatgatgagn	ccggtaatcc	tggcacgtgg	nggttgcatg	atnccaccaa	ggaaatnggn	660
gggggnggac	ctgcccggcg	gccgttcnaa	agcccaattc	cacacacttg	gnggccgtac	720
tatggatccc	actcngtcca	acttgngnga	atatggcata	actttt		766

<213> Homo sapien

tcgagcggcc	gcccgggcag	gtccttgacc	ttttcagcaa	gtgggaaggt	gtaatccgtc	60
tccacagaca	aggccaggac	tcgtttgtac	ccgttgatga	tagaatgggg	tactgatgca	120
acagttgggt	agccaatctg	cagacagaca	ctggcaacat	tgcggaacc	ctccaggaag	180
cgagaatgca	gagtttcttc	tgtgatatca	agcacttcag	ggttgtagat	gctgccattg	240
tcgaacacct	gctgggatgac	cagcccaaag	gagaaggggg	agatgttgag	catgttcagc	300
agcgtggctt	cgtctggctcc	cactttgtct	ccagtcttga	tcagacctcg	gccgcgacca	360
cgct						364

<213> Homo sapien

agcgtgggtcg	cggccgaggt	ctgtcctaca	gtcctcagga	ctctactccc	tacgcagcgt	60
ggtgaccgtg	ccctccagca	acttcggcac	ccagacctac	acctgcaacg	tagatcaciaa	120
gccagcaac	accaaggtgg	acaagagagt	tgagcccaaa	tcttgtagaca	aaactcacac	180
atgcccaccg	tgcccagcac	ctgaactcct	ggggggaccg	tcagtcttcc	tcttcccccg	240
catccccctt	ccaaacctgc	cggggcggcc	gtctg			275

<213> Homo sapien

cgagcggccg	cccgggcagg	tttggaaggg	ggatgcgggg	gaagaggaag	actgacggtc	60
cccccaggag	ttcaggtgct	gggcacggtg	ggcatgtgtg	agttttgtca	caagatttgg	120
gctcaactct	cttgtccacc	ttggtgttgc	tgggcttgtg	atctacgttg	caggtgtagg	180
tctgggtgcc	gaagttgctg	gagggcacgg	tcaccacgct	gctgagggag	tagagtcctg	240
aggactgtag	gacagacctc	ggccgcgacc	acgct			275

```
<220>  
<221> misc_feature  
<222> (1) ... (40)  
<223> n = A,T,C or G
```

<400> 229
nggnnggtcc ggnengncag gaccactcnt cttcgaaata 40

```

<400> 230
ggtcg cggccgaggt cctcacttgc ctcttgcaaa gcaccgatag ctgcgcctctg      60
gcaga tctgttttaa agtcctgagc aatttctcgc accagacgct ggaaggggaag      120
gaatc agaagttcag tggacttctg ataacgtcta atttcacgga gcgccacagt      180
acct  gcccgggcgg ccgctcga                                     208

```

```
<220>
<221> misc_feature
<222> (1) ... (208)
<223> n = A,T,C or G
```

<400>	231						
tcgagcggcc	gcccgggcag	gtcctgggtac	tgnggcgctc	cgtgaaatta	gacgttatca		60
gaagtcctact	gaacttctga	ttcgcaaact	tccttccag	cgtctggtgc	gagaaattgc		120
tcaggacttt	aaaacagatc	tgcgcttcca	gagcgcagct	atcggtgctt	tgaggaggc		180
aagtgaggac	ctcggcgcgcg	accacgct					208

```
<210> 232
<211> 332
<212> DNA
<213> Homo sapien
```


<400> 232

tcgagcggcc	gcccgggcag	gtccacatcg	gcagggtcgg	agccctggcc	gccatactcg	60
aactggaatc	catcggtcat	gctctcgccg	aaccagacat	gcctcttgtc	cttgggggttc	120
ttgctgatgt	accagttctt	ctggggccaca	ctgggctgag	tgggggtacac	gcaggtctca	180
ccagtctcca	tgttgccagaa	gactttgatg	gcatccaggt	tgcagccttg	gttgggggtca	240
atccagtact	ctccactctt	ccagtcagag	tggcacatct	tgaggtcacg	gcaggtgcgg	300
gcgggggttct	tgacctcggc	cgcgaccacg	ct			332

<210> 233

<211> 415

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(415)

<223> n = A,T,C or G

<400> 233

gtgggnttga	accnttttna	ntcccgcttg	gtaccgagct	cggatccact	agtaacggcc	60
gccagtgtgc	tggaattcgg	cttagcgtgg	tcgcggccga	ggtaagaac	cccggccgca	120
cctgccgtga	cctcaagatg	tgccactctg	actggaagag	tggagagtac	tggattgacc	180
ccaaccaagg	ctgcaacctg	gatgccatca	aagtcttctg	caacatggag	actggtgaga	240
cctgccgtga	ccccactcag	cccagtgtgg	cccagaagaa	ctggtacatc	agcaagaacc	300
ccaaggacaa	gaggcatgtc	tggttcggcg	agagcatgac	cgatggattc	cagttcgagt	360
atggcggcca	gggctccgac	cctgccgatg	tggacctgce	cgggcggccg	ctcga	415

<210> 234

<211> 776

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(776)

<223> n = A,T,C or G

<400> 234

agcgtggctg	cggccgaggt	ctgggatgct	cctgctgtca	cagtgagata	ttacaggatc	60
acttacggag	aaacaggagg	aaatagccct	gtccaggagt	tcactgtgcc	tgggagcaag	120
tctacagcta	ccatcagcgg	ccttaaacct	ggagttgatt	ataccatcac	tgtgtatgct	180
gtcactggcc	gtggagacag	ccccgcaagc	agcaagccaa	tttccattaa	ttaccgaaca	240
gaaattgaca	aaccatccca	gatgcaagtg	accgatgttc	aggacaacag	cattagtgtc	300
aagtggctgc	cttcaagtgc	ccctgttact	ggttacagag	taaccaccac	tcccaaaaat	360
ggaccaggac	caacaaaaac	taaaactgca	ggtccagatc	aaacagaaat	gactattgaa	420
ggcttgacgc	ccacagtggg	gtatgtggtt	aagtgtctat	gtccagaatc	caagcggaga	480
gaagtacgcc	tctgggttcag	actgnaagta	accaacattg	atcgctaaa	ggactggcat	540
tcactgatgn	ggatgccgat	tccatcaaaa	ttgnttgagg	aaacccacag	gggcaagttt	600
ncangtcnag	gnngacctac	tcgagccctg	aggatggaat	ccttgactnt	tccttnncc	660
gatggggaaa	aaaaaccttn	aaaacttgaa	ggacctgccc	gggcggccgt	ncaaaaccca	720

attccacccc cttgggggcg ttctatgggn cccactcgga ccaaacttgg ggtaan

776

<210> 235

<211> 805

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(805)

<223> n = A,T,C or G

<400> 235

tcgagcggcc	gcccgggcag	gtccttgacg	ctctgcagtg	tcttcttcac	catcaggtgc	60
agggaatagc	tcatggattc	catcctcagg	gctcgagtag	gtcaccctgt	acctggaaac	120
ttgcccctgt	gggctttccc	aagcaatttt	gatggaatcg	gcatccacat	cagtgaatgc	180
cagtccttta	gggcgatcaa	tgttggttac	tgcagtctga	accagaggct	gactctctcc	240
gcttggtatc	tgagcataga	cactaaccac	atactccact	gtgggctgca	agccttcaat	300
agtcattttc	gtttgatctg	gacctgcagt	tttagttttt	gttggtcctg	gtccattttt	360
gggagtgggtg	gttactctgt	aaccagtaac	aggggaactt	gaaggcagcc	acttgacact	420
aatgctgttg	tctgaacat	cggtcacttg	catctgggat	ggtttgtcaa	tttctgttcg	480
gtaattaatg	gaaattggct	tgctgcttgc	ggggcttgct	tccacggcca	gtgacagcat	540
acacagtgat	ggtataatca	actccagggt	taagccgctg	atggtagctg	aaactttgct	600
ccaggcacaa	gtgaactcct	gacagggcta	tttctnctg	ttctccgtaa	gtgatcctgt	660
aatatctcac	tgggacagca	ggangcattc	caaaacttcg	ggcngaccc	cctaagccga	720
attntgcaat	atncatcaca	ctggcgggcg	ctcgancatt	cattaaaagg	cccaatcncc	780
cctataggga	gtntantaca	attng				805

<210> 236

<211> 262

<212> DNA

<213> Homo sapien

<400> 236

tcgagcggcc	gcccgggcag	gtcacttttg	gtttttggct	atgttcggtt	ggtcaaagat	60
aaaaactaag	tttgagagat	gaatgcaaag	gaaaaaaata	ttttccaaag	tccatgtgaa	120
attgtctccc	atTTTTTTTg	cttttgaggg	ggttcagttt	gggttgcttg	tctgtttccg	180
ggttgggggg	aaagttgggt	gggtgggagg	gagccagggt	gggatggagg	gagtttacag	240
gaagcagaca	gggccaacgt	cg				262

<210> 237

<211> 372

<212> DNA

<213> Homo sapien

<400> 237

agcgtgggtc	cggccgagg	cctcaccaga	ggtgccacct	acaacatcat	agtggaggca	60
ctgaaagacc	agcagaggca	taaggttcgg	gaagaggttg	ttaccgtggg	caactctgtc	120
aacgaaggct	tgaaccaacc	tacggatgac	tcgtgctttg	acccctacac	agtttcccat	180
tatgccgttg	gagatgagtg	ggaacgaatg	tctgaatcag	gctttaaact	gttgtgccag	240
tgcttaggct	ttggaagtgg	tcatttcaga	tgtgattcat	ctagatgggtg	ccatgacaat	300

```
<210> 238
<211> 372
<212> DNA
<213> Homo sapien
```

```
<210> 239
<211> 720
<212> DNA
<213> Homo sapien
```

```
<210> 240
<211> 691
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(691)
<223> n = A,T,C or G
```

<400> 242

agcgtggtcg cggccgaggt cnagga

26

<210> 243
 <211> 697
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(697)
 <223> n = A,T,C or G

<400> 243
 tcgagcggcc gcccgggcag gtccaccaca cccaattcct tgctggtatc atggcagccg 60
 ccacgtgccg ggattaccgg ctacatcatc aagtatgaga agcctggggtc tcctcccaga 120
 gaagtgggtcc ctcggccccg ccctggtgtc acagaggcta ctattactgg cctggaaccg 180
 ggaaccgaat atacaattta tgtcattgcc ctgaagaata atcagaagag cgagcccctg 240
 attggaagga aaaagacaga cgagcttccc caactggtaa cccttcacac cccaatctt 300
 catggaccag agatcttgga tgttccttcc acagttcaaa agaccccttt cgtcaccac 360
 cctgggtatg acactggaaa tgggtattcag ctctcctggca cttctggtca gcaaccacg 420
 gttgggcaac aaatgatctt tgaggaacat ggttttaggc ggaccacacc gccacaacg 480
 ggcaccccc taaggnatag gccaagacca taccgcgcg aatgtaggac aagaagctct 540
 ntctcaacaa ccattctcat ggcaccttcc caggacactt ctgagtacat catttcatgt 600
 catcctggtg ggcacttgat gaanaacctt tacagttcag ggttcctgga acttctacca 660
 gngccacttc tgacagganc ttgggcgnga ccacctt 697

<210> 244
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 244
 agcgtggtcg cggccgaggt ccattttctc cctgacggtc ccacttctct ccaatcttgt 60
 agttcacacc attgtcatgg caccatctag atgaatcaca tctgaaatga ccacttccaa 120
 agcctaagca ctggcacaac agtttaaagc ctgattcaga cattcggtcc cactcatctc 180
 caacggcata atgggaaact gtgtaggggt caaagcacga gtcacccgta ggttggttca 240
 agccttcggt gacagagttg cccacggtaa caacctcttc ccgaacctta tgctctgct 300
 ggtctttcag tgcctccact atgatgttgt aggtggcacc tctggtgagg acctgcccg 360
 gcggcccgct cga 373

<210> 245
 <211> 307
 <212> DNA
 <213> Homo sapien

<400> 245
 agcgtggtcg cggccgaggt gtgccccaga ccaggaattc ggcttcgacg ttggccctgt 60
 ctgcttcctg taaactccct ccattcccaac ctggctccct cccacccaac caactttccc 120
 cccaacccgg aaacagacaa gcaacccaaa ctgaaccccc tcaaaagcca aaaaaatggg 180
 agacaatttc acatggactt tggaaaatat ttttttctt tgcattcatc tctcaaaactt 240
 agttttttatc tttgaccaac cgaacatgac caaaaaccaa aagtgcactg cccgggcggc 300

09635804-081000

cgctcga

307

<210> 246

<211> 372

<212> DNA

<213> Homo sapien

<400> 246

tcgagcggcc	gcccgggcag	gtcctcacca	gaggtgccac	ctacaacatc	atagtggagg	60
cactgaaaga	ccagcagagg	cataaggttc	gggaagaggt	tgttaccgtg	ggcaactctg	120
tcaacgaagg	cttgaaccaa	cctacggatg	actcgtgctt	tgacccctac	acagtttccc	180
attatgccgt	tggagatgag	tgggaacgaa	tgtctgaatc	aggctttaaa	ctgttggtgcc	240
agtgcctagg	ctttggaagt	ggtcatttca	gatgtgattc	atctagatgg	tgccatgaca	300
atgggtgtgaa	ctacaagatt	ggagagaagt	gggaccgtca	gggagaaaat	ggacctcggc	360
cgcgaccacg	ct					372

<210> 247

<211> 348

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(348)

<223> n = A,T,C or G

<400> 247

tcgagcggcc	gcccgggcag	gtaccgggggt	ggtcagcgag	gagccattca	cactgaactt	60
caccatcaac	aacctgcggt	atgaggagaa	catgcagcac	cctggctcca	ggaagttcaa	120
caccacggag	agggctcctt	agggcctgct	caggctcctg	ttcaagagca	ccagtgttgg	180
ccctctgtac	tctggctgca	gactgacttt	gctcagacct	gagaaacatg	gggcagccac	240
tggagtggac	gccatctgca	ccctccgcct	tgatcccact	ggtinctggac	tggacanana	300
gcggctatac	ttgggagctg	anccnaacct	ttggcgngga	cncnctt		348

<210> 248

<211> 304

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(304)

<223> n = A,T,C or G

<400> 248

gaggactggc	tcagctccca	gtatagccgc	tctctgtcca	gtccaggacc	agtgggatca	60
aggcggagg	tgcagatggc	gtccactcca	gtggctgccc	catgtttctc	aagtctgagc	120
aaagncagtc	tgcagccaga	gtacagaggg	ccaacactgg	tgctcttgaa	cagggacctg	180
agcaggccct	gaaggaccct	ctccgtgggt	ttgaacttcc	tggagccagg	gtgctgcatg	240
ttctcctcat	accgcaggtt	gttgatgggt	aagttcagtg	tgaatggctc	ctcgtgacc	300
accc						304

05635304 091000

<400> 249

```
<220>
<221> misc_feature
<222> (1) ... (400)
<223> n = A, T, C or G
```

<400> 250

```
<220>
<221> misc_feature
<222> (1) ... (514)
<223> n = A,T,C or G
```

<400> 251

agcgtggncg cggccgaggt ctgaggatgt aaactcttcc caggggaagg ctgaagtgct 60

```
<210> 252
<211> 501
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(501)
<223> n = A,T,C or G
```

```
<210> 253
<211> 226
<212> DNA
<213> Homo sapien
```

```
<210> 254
<211> 226
<212> DNA
<213> Homo sapien
```

<400>	254						
agcgtgggtcg	cggccgaggt	ccagtcgcag	catgctcttt	ctcctgccca	ctggcacagt		60
gaggaagatc	tctgctgtca	gtgagaaggc	tgtcatccac	tgagatggca	gtcaaaagtg		120
catttaatac	acctaacgta	tcgaacatca	tagcttggcc	caggttatct	catatgtgct		180
cagaacactt	acaatagcct	gcagacctgc	ccgggcggcc	gctcga			222

actaatgctg gtggcctgaa catcggtcac ttgcatctgg gatggtttgg tcaatttctg 480
 ttcggttaatt aatgggaaat tggcttactg gcttgccggg gctgtctcca cggncagtga 540
 caagcataca caggngatgg gtataatcaa ctccaggttt aaggccnctg atggta 596

<210> 266
 <211> 506
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(506)
 <223> n = A,T,C or G

<400> 266
 agcgtgggtcg cggccgaggt ctgggatgct cctgctgtca cagtgaagata ttacaggatc 60
 acttacggag aaacaggagg aaatagccct gtccaggagt tcaactgtgcc tgggagcaag 120
 tctacagcta ccatcagcgg ccttaaactt ggagttgatt ataccatcac tgtgtatgct 180
 gtcactggcc gtggagacag ccccgcaagc agtaagccaa tttccattaa ttaccgaaca 240
 gaaattgaca aaccatccca gatgcaagtg accgatgttc aggacaacag cattagtgtc 300
 aagtggctgc cttcaagttc ccctgttact ggttacagag taaccaccac tccccaaaat 360
 gggaccagga ccaacaaaaa actaaaactg canggtccag atcaaacaga aatgactatt 420
 gaaggcttgc agcccacagt ggagtatgtg ggtagtgtc tatgtctcaga atnccaagcg 480
 gagagagtca gcctctgggt cagact 506

<210> 267
 <211> 548
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(548)
 <223> n = A,T,C or G

<400> 267
 tcgagcggcc gcccgggcag gtcagcgctc tcaggacgtc accaccatgg cctgggctct 60
 gctcctcctc accctcctca ctcagggcac agggctcctg gccagctctg ccctgactca 120
 gcctccctcc gcgtccgggt ctcttgaca gtcagtcacc atctcctgca ctggaaccag 180
 cagtacgtt ggtgcttatg aatttgtctc ctggtaccaa caacaccag gcaaggcccc 240
 caaactcatg atttctgagg tcaactaagc gccctcaggg gtccctgacg gcttctctgg 300
 ctccaagtct ggcaacacgg cctccctgac cgtctctggg ctccangctg aggatgangc 360
 tgattattac tggaagctca tatgcaggca acaacaattg ggtgttcggc ggaagggacc 420
 aagctgaccg tnctaaggct aagcccaagg cttgcccccc tcggctcactc tgttcccacc 480
 ctctctgtaa gaagctttca agccaacaan gncacactgg gtgtgtctca taagtggact 540
 ttctaccc 548

<210> 268
 <211> 584
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(584)
 <223> n = A,T,C or G

<400> 268
 agcgtgggtcg cggccgaggt ctgtagcttc tgtgggactt ccactgctca ggcgtcaggc 60
 tcaggtagct gctggccgog tacttgttgt tgctttgntt ggaggggtgtg gtgggtctcca 120
 ctcccgctt gacggggctg ctatctgctt tccaggccac tgtcacggct cccgggtaga 180
 agtcacttat gagacacacc agtgtggcct tgttggcttg aagctcctca gaggaggggtg 240
 ggaacagagt gaccgagggg gcagccttgg gctgacctag gacggtcagc ttgggtccctc 300
 cgccgaacac ccaattgttg ttgcctgcat atgagctgca gtaataatca gcctcatcct 360
 cagcctggag cccagagacn gtcaagggag gcccggtgtt gccaaagactt ggaagccaga 420
 naagcgatca gggacccctg agggccgctt tacngacctc aaaaaatcat gaatttgggg 480
 ggcttttggc tggnggttgg ttggtnacca gnaaaacaaa atttcataaa gcaccaacgt 540
 cactgctggt ttccagtgc ngaanatggt gaactgaant gtcc 584

<210> 269
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 269
 agcgtgggtcg cggccgaggt ccagcatcag gagccccgcc ttgccggctc tggtcategc 60
 ctttcttttt gtggcctgaa acgatgtcat caattcgtag tagcagaact gccgtctcca 120
 ctgctgtctt ataagtctgc agcttcacag ccaatggctc ccatatgcc agttccttca 180
 tgtccaccaa agtaccgctc tcaccattta cccccagggt ctcacagttc tcctgggtgt 240
 gcttggcccg aaggaggta agtanacgga tgggtgctggt cccacagttc tggatcaggg 300
 tacgaggaat gacctctagg gcctgggcn aagccctgt atggacctgc cggggcgggc 360
 ccgctcga 368

<210> 270
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 270
 tcgagcggcc gcccgggcag gtccatacag ggctgttgcc caggccctag aggn cattcc 60
 ttgtaccctg atccagaact gtgggaccag caccatccgt ctacttacct cccttcgggc 120
 caagcacacc caggagaact gtgagacctg ggggtgtaa at gngagacgg gtactttgtg 180

<220>
 <221> misc_feature
 <222> (1)...(579)
 <223> n = A,T,C or G

<400> 273
 agcgtggtcg cggccgaggt ctggccctcc tggcaaggct ggtgaagatg gtcaccctgg 60
 aaaacccgga cgacctggtg agagaggagt tgttggacca caggggtgctc gtggtttccc 120
 tggaactcct ggacttcctg gottcaaagg cattagggga cacaatggtc tggatggatt 180
 gaagggacag cccggtgctc ctggtgtgaa gggggaacct ggngcccctg gtgaaaatgg 240
 aactccaggt caaacaggag cccgngggct tcctggngag agaggacgtg ttggtgcccc 300
 tggcccanac ctgcccgggc ggccgctcna aaagccgaaa tccagnacac tggcggccgn 360
 tactantgga atccgaactt cgggtacaaa gcttggccgt aatcatggcc atagcttgtt 420
 ccctggggng gaaattggta ttccgctncc aattccacac aacataccga acccgaaag 480
 cattaagtg taaaagccct gggggggcct aaatgangtg agcntaactc ncatttaatt 540
 ggcgttgccg ttcactgccc cgcttttcca gtccgggna 579

<210> 274
 <211> 330
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(330)
 <223> n = A,T,C or G

<400> 274
 tcgagcggcc gcccgggcag gtctgggcca ggggcaccaa cacgtcctct ctcaccagga 60
 agcccacggg ctctgtttg acctggagtt ccattttcac caggggcacc aggttcaccc 120
 ttcacaccag gagcacggg ctgtcccttc aatccatcca gaccattgtg ncccctaattg 180
 cctttgaagc caggaagtcc aggagttcca gggaaaccac gagcaccctg tggccaaca 240
 actcctctct caccaggtcg tccgggtttt ccagggtgac catcttcacc agccttgcca 300
 ggagggccag acctcggccg cgaccacgct 330

<210> 275
 <211> 97
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(97)
 <223> n = A,T,C or G

<400> 275
 ancgtggtcg cggccgaggt cctcaccaga ggtgncacct acaacatcat agtggaggca 60
 ctgaaagacc ancagaggca taagggtcgg gaagagg 97

<210> 276

<211> 610
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(610)
 <223> n = A,T,C or G

<400> 276
 tcgagcggcc gcccgggcag gtccattttc tccctgacgg tcccacttct ctccaatctt 60
 gtagttcaca ccattgtcat ggcaccatct agatgaatca catctgaaat gaccacttcc 120
 aaagcctaag cactggcaca acagttttaa gcctgattca gacattcgtt cccactcatc 180
 tccaacggca taatgggaaa ctgtgtaggg gtcaaagcac gagtcacccg taggttggtt 240
 caagccttcg ttgacagagt tgtccacggg aacaacctct tcccgaaacct tatgcctctg 300
 ctggtctttc agtgccctcca ctatgatgtt gtaggtggca cctctggtga ggacctcngn 360
 ccngaacaac gcttaagccc gnattctgca gaataatccc atcacacttg gcggccgctt 420
 cgancatgca tcntaaaagg ggccccaatt tcccccttat aagngaanc cgtatttncca 480
 atttcaactgg ncccgccgnt tttaaaaacg ncgggtgaact ggggaaaaaac cctggcggtt 540
 acccaacttt aatcgccntt ggcagcacia tcccccttt tcgnccancn tgggcgtaaa 600
 taaccgaaaa 610

<210> 277
 <211> 38
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(38)
 <223> n = A,T,C or G

<400> 277
 ancngngtcg cggccganct nttttttctt nttttttt 38

<210> 278
 <211> 443
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(443)
 <223> n = A,T,C or G

<400> 278
 agcgtggtcg cggccgaggt ctgaggttac atgcgtgggt gtggacgtga gccacgaaga 60
 ccctgaggtc aagttcaact ggtacgtgga cggcgtggag gtgcataatg ccaagacaaa 120
 gccgcgggag gagcagtaca acagcacgta cgggngggtc agcgtcctca ccgtcctgca 180
 ccagaattgg ttgaatggca aggagtacaa gngcaagggt tccaacaaag cctccccagc 240
 cccntcga aaaccattt ccaaagccaa agggcagccc cgagaaccac aggtgtacac 300

<222> (1)...(331)

<223> n = A,T,C or G

<400> 284

tcgagcggcc	gcccgggcag	gtctgggtggg	gtcctggcac	acgcacatgg	ggngttgnt	60
ctnatccagc	tgcccagccc	ccattggcga	gtttgagaag	gtgtgcagca	atgacaacaa	120
naccttcgac	tcttcctgcc	acttctttgc	cacaaagtgc	accctggagg	gcaccaagaa	180
gggccacaag	ctccacctgg	actacatcgg	gccttgcaaa	tacatcccc	cttgctgga	240
ctctgagctg	accgaattcc	cccttgcgca	tgcgggactg	gctcaagaac	cgctcctggca	300
cccttgatatg	anagggatga	agacacnacc	c			331

<210> 285

<211> 509

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(509)

<223> n = A,T,C or G

<400> 285

agcgtggtcg	cggcgcaggt	ctgtectaca	gtcctcagga	ctctactccc	tcagcagcgt	60
ggtgaccgtg	ccctccagca	acttcggcac	ccagacctac	acctgcaacg	tagatcacaa	120
gcccagcaac	accaaggtgg	acaagagagt	tgagcccaaa	tcttgtgaca	aaactcacac	180
atgcccaccg	tgcccagcac	ctgaactcct	ggggggaccg	tcagtcttcc	tcttcccccg	240
catccccctt	ccaaacctgc	ccgggcggcc	gctcgaaagc	cgaattccag	cacactggcg	300
gccggtacta	gtgganccna	acttggnanc	caacctggng	gaantaatgg	gcataanctg	360
tttctggggg	gaaattggta	tcnngtttac	aattcccnca	caacatacga	gccggaagca	420
taaaagngta	aaagcctggg	ggnggcctan	tgaagtgaag	ctaaactcac	attaattngc	480
gttgccgctc	actggcccg	ttttccagc				509

<210> 286

<211> 336

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(336)

<223> n = A,T,C or G

<400> 286

tcgagcggcc	gcccgggcag	gtttggaagg	gggatgcggg	ggaagaggaa	gactgacggt	60
ccccccagga	gttcagggtg	tgggcacggg	gggcatgtgt	gagttttgtc	acaagatttg	120
ggetcaactc	tcttgccac	cttggtgttg	ctgggcttgt	gatctacgtt	gcagggtgtag	180
gtctggngc	cgaagttgct	ggagggcacg	gtcaccacgc	tgctgaggga	gtagagtcct	240
gaggactgta	ngacagacct	cggccgngac	cacgctaagc	cgaattctgc	agatatccat	300
cacactggcg	gccgctccga	gcatgcattt	tagagg			336

<210> 287

<212> DNA

<213> Homo sapien

<400> 293

agcgtgggtcg	cggccgaggt	tgtacaagct	tttttttttt	tttttttttt	tttttttttt	60
tttttttttt	tttttttttt	tttttttttt	tttttttttt	t		101

<210> 294

<211> 285

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (285)

<223> n = A,T,C or G

<400> 294

tcgagcggcc	gcccgggcag	gtctgccaac	accaagattg	gccccgcg	catccacaca	60
gttngtgtgc	ggggaggtaa	caagaaatac	cgtgcctga	ggntggacgn	ggggaatttc	120
tcctggggct	cagagtgttg	tactcgtaaa	acaaggatca	tcgatgttgt	ctacaatgca	180
tctaataacg	agctggttcg	taccaagacc	ctgggtgaaga	attgcatcgt	gctcatngac	240
agcacaccgt	accgacagtg	ggtaccgaag	tcccactatg	cncct		285

<210> 295

<211> 216

<212> DNA

<213> Homo sapien

<400> 295

tcgagcggcc	gcccgggcag	gtccaccaca	cccaattcct	tgctgggtatc	atggcagccg	60
ccacgtgcc	ggattaccgg	ctacatcatc	aagtatgaga	agcctgggtc	tcctcccaga	120
gaagtgggtc	ctcgggccccg	ccctgggtgtc	acagaggcta	ctattactgg	cctggaaccg	180
ggaaccgaat	atacaattta	tgtcattgcc	ctgaag			216

<210> 296

<211> 414

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (414)

<223> n = A,T,C or G

<400> 296

agcgtgntcn	cggccgagga	tggggaagct	cgntctgtctt	tttccttcca	atcaggggct	60
nnntcttctg	attattcttc	agggcaanga	cataaattgt	atattcggnt	cccggttcca	120
gnccagtaat	agtagcctct	gtgacaccag	ggcggggccg	agggaccact	tctctgggag	180
gagaccaggy	cttctcatat	ttgatgatga	agccggtaat	cctggcacgt	gggcggctgc	240
catgatacca	ccaangaatt	gggtgtgggtg	gacctgccc	ggcggggccg	tcgaaaancc	300

```
gaattcntgc aagaatatcc atcacacttg ggcggggccgn tcgaaccatg catcntaaaa 360
gggcccgaat ttcccccccta ttagngngaag ccncatttaa caaattccac ttgg 414
```

```
<210> 297
<211> 376
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(376)
<223> n = A,T,C or G
```

```
<400> 297
tcgagcggcc gcccgggcag gtctcgcggt cgcactgggtg atgctgggtcc tgttgggtccc 60
cccgccctc ctggacctcc tgggtccccc ggtcctccca gcgctgggtt cgacttcagc 120
ttctgcccc agccacctca agagaaggct cagcatgggtg gccgctacta ccgggctgat 180
gatgccaatg tggttcgtga ccgtgacctc gaggtggaca ccacctcaa gagccttgag 240
ccagcagaat cgaaaacatt cggaacccaa gaagggcaag cccgcaaaga aaccccgccc 300
gcacctggcc gngaacctcc aagaangtgc ccacntcttg actgggaaaa aaagggaaaa 360
ntacttgga ttggac 376
```

```
<210> 298
<211> 357
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(357)
<223> n = A,T,C or G
```

```
<400> 298
agcgtgggtcg cggccgaggt ccacatcggc aggggtcggag ccctggccgc catactcgaa 60
ctggaatcca tcggtcatgc tctcgccgaa ccagacatgc ctcttgctct tggggttctt 120
gctgatgtac cagttcttct gggccacact gggctgagtg gggtagacgc aggtctcacc 180
agtctccatg ttgcagaaga ctttgatggc atccagggtg cagccttggg tggggtaaat 240
ccagtactct ccactcttcc agtcagaagt ggcacatctt gaggtcacgg caggggtgcgg 300
gcgggggttct tgcgggctgc cttctgggc tcccgggaat ttctnngaac ttgctgg 357
```

```
<210> 299
<211> 307
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(307)
<223> n = A,T,C or G
```

```
<400> 299
```



```
<210> 300
<211> 351
<212> DNA
<213> Homo sapien
```

```
<210> 301
<211> 330
<212> DNA
<213> Homo sapien
```

```
<210> 302
<211> 317
<212> DNA
<213> Homo sapien
```

```
<220>
<221> misc_feature
<222> (1)...(317)
<223> n = A,T,C or G
```

<400>	302						
agcgtgggtcg	cggccgaggt	ctgtactggg	agctaagcaa	actgaccaat	gacattgaag		60
agctggggccc	ctacaccctg	gacaggaaca	gtctctatgt	caatgggttc	acccatcaga		120
gctctgtgnc	caccaccagc	actcctggga	cctccacagt	ggatttcaga	acctcagggg		180
ctccatcctc	cctctccagc	cccacaatta	tggtgctgg	ccctctcctg	gtaccattca		240
ccctcaactt	caccatcacc	aacctgcagt	atggggagga	catgggtcac	cctgnctcca		300
qqaagttaa	caccaca						317

<400> 303

<400> 304

<400> 305

<210>	306
<211>	246
<212>	DNA

<223> n = A, T, C or G

tgcagcggtc	gcccgggcag	gtccaccggg	atagccgggg	gtctggcagg	aatgggaggc	60
atccagaacg	agaaggagac	catgcaaagc	ctgaacgacc	gcctggcctc	ttacctggac	120
agagtgagga	gcctggagac	cganaaccgg	aggctggana	gcaaaatccg	ggagcacttg	180
gagaagaagg	gaccccgagt	caagagactg	gagccattac	ttcaagatca	tcgagggacc	240
tggagg						246

<213> Homo sapien

<223> n = A, T, C or G

agcngggtcg	cggccgaggt	ccagctctgt	ctcatacttg	actctaaagt	catcagcagc	60
aagacgggca	ttgtcaatct	gcagaacgat	gcgggcattg	tccgcagtat	ttgcgaagat	120
ctgagccctc	aggtcctcga	tgatcttgaa	gtaatggctc	cagtctctga	cctgggggtcc	180
cttctttctcc	aagtgtctcc	ggattttgct	ctccagcctc	cggttctcgg	tctccagget	240
cctcactctg	tccaggtaag	aaggcccagg	cggtcgttca	ggctttgcat	ggtctccttc	300
tcgttctgga	tgctctcccat	tcctgccaga	ccc			333

<213> Homo sapien

tgcagcggcc	gcccgggcag	gtcaggaagc	acattggtct	tagagccact	gcctcctgga	60
ttccacctgt	gctgcggaca	tctccagggg	gtgcagaagg	gaagcagggtc	aaactgctca	120
gatcagtcag	actggctggt	ctcagttctc	acctgagcaa	ggtcagtctg	cagccagagt	180
acagagggcc	aacactgggtg	ttcttgaaca	agggcttgag	cagaccctgc	agaaccctct	240
tccgtgggtg	tgaacttcct	ggaaaccagg	gtgttgcatg	tttttctctc	taatgcaagg	300
ttgggtgatgg						310

<213> Homo sapien

<400> 309

agcgtgggtcg	cggccgaggt	ccacatcggc	agggtcgag	ccttggccgc	catactcgaa	60
ctggaatcca	tcggtcatgc	tctcgccgaa	ccagacatgc	ctcttgtcct	tggggttctt	120
gctgatgtac	cagttcttct	gggccacact	gggctgagtg	gggtacaccg	caggtctcac	180
cagtctccat	gttgacagaag	actttgatgg	catccagggt	gcagccttgg	ttgggggtcaa	240
tccagtactc	tccactcttc	cagtcagaag	tgggcacatc	ttgaggtcac	cggcaggtgc	300
cgggcggggg	gttcttgcgg	cttgccctct	gggctcggga	tgttctcgat	ctgcttggct	360
caggctcttg	agggtgggtg	tccacctcga	ggtcacggtc	accgaaacct	gcccgggcgg	420
cccgtctga						429

<210> 310

<211> 430

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (430)

<223> n = A,T,C or G

<400> 310

tcgagcggtc	gcccgggcag	gtttcgtgac	cgtgacctcg	agggtggacac	caccctcaag	60
agcctgagcc	agcagatcga	gaacatccgg	agcccagagg	gcagccgcaa	gaaccccgcc	120
cgcacctgcc	gtgacctcaa	gatgtgccac	tctgactgga	agagtggaga	gtactggatt	180
gaccccaacc	aaggctgcaa	cctggatgcc	atcaaagtct	tctgcaacat	ggagactggt	240
gagacctgcg	tgtacccccac	tcagcccagt	gtggggccag	aagaaactgg	tacatcagca	300
aggaacccca	aggacaagag	gcattgtctt	ggttcggcga	gnagcatgac	ccgatggatt	360
ccagtttcga	gtattggcgg	ccagggcttc	ccgacccttg	ccgatgtgga	cctcggccgc	420
gaccaccgct						430

<210> 311

<211> 2996

<212> DNA

<213> Homo sapien

<400> 311

cagccaccgg	agtggatgcc	atctgcaccc	accgccctga	ccccacaggc	cctgggctgg	60
acagagagca	gctgtatttg	gagctgagcc	agctgaccca	cagcatcact	gagctggggc	120
cctacaccct	ggacagggac	agtctctatg	tcaatggttt	cacacagcgg	agctctgtgc	180
ccaccactag	cattcctggg	acccccacag	tggacctggg	aacatctggg	actccagttt	240
ctaaacctgg	tccctcggt	gccagccctc	tcttgggtgt	attcactctc	aacttcacca	300
tcaccaacct	gcggtatgag	gagaacatgc	agcaccctgg	ctccaggaag	ttcaacacca	360
cggagagggt	ccttcagggc	ctgggtccctg	ttcaagagca	ccagtgttgg	ccctctgtac	420
tctggctgca	gactgacttt	gctcaggcct	gaaaaggatg	ggacagccac	tggagtggat	480
gccatctgca	cccaccaccc	tgaccccaaa	agccctaggc	tggacagaga	gcagctgtat	540
tgggagctga	gccagctgac	ccacaatatc	actgagctgg	gcccctatgc	cctggacaac	600
gacagcctct	ttgtcaatgg	tttcaactcat	cggagctctg	tgtccaccac	cagcactcct	660
gggaccccca	cagtgtatct	gggagcatct	aagactccag	cctcgatatt	tggcccttca	720
gctgccagcc	atctcctgat	actattcacc	ctcaacttca	ccatcactaa	cctgcggtat	780
gaggagaaca	tgtggcctgg	ctccaggaag	ttcaacacta	cagagagggt	ccttcagggc	840
ctgctaaggc	ccttgttcaa	gaacaccagt	gttggccctc	tgtactctgg	ctgcaggctg	900
accttgcctca	ggccagagaa	agatggggaa	gccaccggag	tggatgccat	ctgcaccac	960

cgccctgacc ccacaggccc tgggctggac agagagcagc tgtatatttga gctgagccag 1020
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<210> 312

<211> 914

<212> PRT

<213> Homo sapien

<400> 312

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			20					25					30		
Asn	Leu	Val	Pro	Arg	Leu	Pro	Ala	Leu	Ser	Trp	Cys	Tyr	Ser	Leu	Ser
		35				40					45				
Thr	Ser	Pro	Ser	Pro	Thr	Cys	Gly	Met	Arg	Arg	Thr	Cys	Ser	Thr	Leu
	50				55						60				
Ala	Pro	Gly	Ser	Ser	Thr	Pro	Arg	Arg	Gly	Ser	Phe	Arg	Ala	Trp	Ser
65					70					75					80

															485																490																495	
Pro	Asp	Met	Gly		Lys	Gly	Ser	Ala	Thr	Phe	Asn	Ser	Thr	Glu	Gly	Val																																
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Tyr	Gln	Ile	Asn	Phe	His	Ile	Val	Asn	Trp	Asn	Leu	Ser	Asn	Pro	Asp																																	
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Val	Thr	Thr	Leu	Tyr	Lys	Gly	Ser	Gln	Leu	His	Asp	Thr	Phe	Arg	Phe																																	
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Cys	Leu	Val	Thr	Asn	Leu	Thr	Met	Asp	Ser	Val	Leu	Val	Thr	Val	Lys																																	
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Ala	Leu	Phe	Ser	Ser	Asn	Leu	Asp	Pro	Ser	Leu	Val	Glu	Gln	Val	Phe																																	
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Leu	Asp	Lys	Thr	Leu	Asn	Ala	Ser	Phe	His	Trp	Leu	Gly	Ser	Thr	Tyr																																	
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Gln	Leu	Val	Asp	Ile	His	Val	Thr	Glu	Met	Glu	Ser	Ser	Val	Tyr	Gln																																	
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Pro	Thr	Ser	Ser	Ser	Ser	Thr	Gln	His	Phe	Tyr	Leu	Asn	Phe	Thr	Ile																																	
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Glu	Pro	Leu	Thr	Gly	Asn	Ser	Asp	Leu	Pro	Phe	Trp	Ala	Val	Ile	Leu																																	
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Ile	Gly	Leu	Ala	Gly	Leu	Leu	Gly	Leu	Ile	Thr	Cys	Leu	Ile	Cys	Gly																																	
865																870																875																880
Val	Leu	Val	Thr	Thr	Arg	Arg																																										

Gln Gln Gln Cys Pro Gly Tyr Tyr Gln Ser His Leu Asp Leu Glu Asp
 900 905 910
 Leu Gln

<210> 313
 <211> 656
 <212> DNA
 <213> Homo sapiens

<400> 313
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 ttgtaaagga aagccacaac atgtccaagg gacctgaggg gacttggagg ctgagcaaag 120
 tgcagtttgt ctacgactcc tcggagaaaa cccacttcaa agacgcagtc agtgctggga 180
 agcacacagc caactcgcac cacctctctg ccttgggtcac ccccgctggg aagtcctatg 240
 agtgctcaagc tcaacaaaacc atttcaactgg cctctagtga tccgcagaag acggtcacca 300
 tgatcctgtc tgcggtccac atccaacctt ttgacattat ctcagatttt gtcttcagtg 360
 aagagcataa atgcccagtg gatgagcggg agcaactgga agaaaccttg cccctgattt 420
 tggggctcat cttgggcctc gtcacatggg taacaactgc gatttaccac gtccaccaca 480
 aaatgactgc caaccagggt cagatccctc gggacagatc ccagtataag cacatgggct 540
 agaggccgtt aggcaggcac cccctattcc tgctcccca actggatcag gtagaacaac 600
 aaaagcactt ttccatcttg tacacgagat acaccaacat agctacaatc aaacag 656

<210> 314
 <211> 519
 <212> DNA
 <213> Homo sapiens

<400> 314
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 gtttaaggat ggtctcggtg gttaggccca ctagaataaa ctgagtccaa tacctctaca 180
 cagttatgtt taactgggct ctctgacacc gggaggaagg tggcgggggt taggtgttgc 240
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 cattcattag ctaatgggtg cctttggtat ttattaaaat caccacagca tagggggact 360
 ttatgttttag gttttgtcta agagttagct tatctgcttc ttgtgctaac agggctattg 420
 ctaccaggga ctttggacat gggggccagc gtttggaaac ctcatctagt ttttttgaga 480
 gataggccac tggccttgga cctcgccgcg gaccacgct 519

<210> 315
 <211> 441
 <212> DNA
 <213> Homo sapiens

<400> 315
 cacagagcgt ttattgacac caccactcct gaaaattggg atttcttatt aggttcccct 60
 aaaagttccc atgttgatta catgtaaata gtcacatata tacaatgaag gcagtttctt 120
 cagaggcaac cagggtttat agtgctaggt aaatgtcatt tcttttgtgc tactgactca 180
 ttgtcaaacy tctctgcact gttttcagcc tctccacggt gcctctgtcc tgcttcttag 240
 ttccttcttt gtgacaaaacc aaaagaataa gaggatttag aacaggactg cttttcccct 300
 atgattttaa aattccaatg actttcgccc ttgggagaaa tttccaagga aatctctctc 360

<220>

<221> misc_feature

<222> (1)...(212)

<223> n = A,T,C or G

<400> 319

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aggggggtcct tccctggctc aggcagatgg gaagatgagg aagccgctga agacgctgtc 120
ggcctcagag ccctggtaaa tgtgaccctt tttgggggtct ttttcaacc anacctgggtc 180
accctgtgtc agacctcggc cgcgaccacg ct 212
```

<210> 320

<211> 769

<212> DNA

<213> Homo sapiens

<400> 320

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tggaggtgta gcagtgcagag gagatgtcag gcaagagtgt cacagcagag ccctaaascc 60
tccaactcac cagtgcagaga tgagactgcc cagtactcag ccttcattct ctggggccacc 120
tggagggcgt ctttctccat cagcgcatat tgagcagggg tactcagatc cttcttggaa 180
cctacaagga agagaagcac actggaaggg tcattctcct tcagggcatc ggccagccac 240
tgccctgccat gggaggtgga aagtaaggga tgagtgcagc tgcagggccc ctccactga 300
cattcatagg cccaattacc ccctctctgg tcctacatgc attcttcttc ttctgacca 360
cccctctgtt ctgaaccctc tcttcccgga gcctccatt atattgcagg atgctcactt 420
acttggtatg ttccagagat gccacatcat tcagggtgaa gacaatgatg atggcttggg 480
agagtggcag aaacagcccc aggttgacag ggaagacact actgctcatt tccccaatcc 540
ttccagctcc atatgagaaa gccatgtgca ctctgagacc cacctacccc acttcaccca 600
gccccttacc ttgagctcct ctatagtagg ttgatgcaat gcatttgaac ctctcctgcc 660
cagcgggtatc ccaactggaa ggaaggaaga gtgaagcaca ggtatgtatc ttgggggggtg 720
tgggtgctgg ggagaaggga tagctggaag ggggtgtggaa gcactcaca 769
```

<210> 321

<211> 690

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(690)

<223> n = A,T,C or G

<400> 321

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cctactcccc cggaggcaac tgggaggtca acgggaagac aatcatcccc tataagaagg 120
gtgcctgggtg ttcgctctgc acagccagtg tctcaggctg cttcaaagcc tgggaccatg 180
cagggggggtc ctgtgaggtc cccaggaatc cttgtgcgat gagctgccag aaccatggac 240
gtctcaacat cagcacctgc cactgccact gtccccctgg ctacacgggc agatactgcc 300
aagtgcagtg cagcctgcag tgtgtgcacg gccgggttcg ggaggaggag tgctcgtgcg 360
tctgtgacat cggctacggg ggagcccagt gtgccaccaa ggtgcatttt ccttccaca 420
cctgtgacct gaggatcgac ggagactgct tcatggtgtc ttcagaggca gacacctatt 480
```


<400> 339
 ttcacctgag gactcatttc gtgccctttg ttgacttcaa gcaaagnctt tcanggtctn 60
 caaggacgnc acatttccac ttgcgaatgn nctcangget catcttgaag aanaagnanc 120
 ccaagtgtctg gatcccagac tcgggggtaa ccttgtgggt aagagctcat ccagtttatg 180
 ctttaggacg tccanctact cgggggagct ggaagcctgc gtggatgcgg ccctgctgga 240
 cctcgccgcg gaccacgcta 260

<210> 340
 <211> 220
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(220)
 <223> n = A,T,C or G

<400> 340
 ctggaagccc ggctnngnct ggcagcggaa ggagccaggc aggttcacgc agcgggtgctg 60
 gcagtagcgg tagcggcact cgtctatgtc cacacactcg ggcccgatct tgcggtaacc 120
 atcagggcag gtgcactgat aggagccagg caagttatgg cagtcctggc tggggcgaca 180
 gtcgtgcagg gcctgggcac actcgtccac atccacacag 220

<210> 341
 <211> 384
 <212> DNA
 <213> Homo sapiens

<400> 341
 ctgctaccag gggagcgaga gctgactatc ccagcctcgg ctaatgtatt ctacgccatg 60
 gatggagctt cacacgattt cctcctgcgg cagcggcgaa ggtcctctac tgctacaccg 120
 ggcgtcacca gtggcccgtc tgccctcagga actcctccga gtgagggagg agggggctcc 180
 tttcccagga tcaaggccac agggaggaag attgcacggg cactgttctg aggaggaagc 240
 cccgttggct tacagaagtc atggtgttca taccagatgt gggtagccat cctgaatggc 300
 ggcaattata tcacattgag acagaaattc agaaagggag ccagccaccc tggggcagtg 360
 aagtgccact ggtttaccag acag 384

<210> 342
 <211> 245
 <212> DNA
 <213> Homo sapiens

<400> 342
 ctggctaagc tcatcattgt tactgggtggg caccatgtcc ttgaagcttc aggcaagcaa 60
 tgtaaccaac aagaatgacc ccaagtccat caactctcga gtcttcattg gaaacctcaa 120
 cacagctctg gtgaagaaat cagatgtgga gaccatcttc tctaagtatg gccgtgtggc 180
 cggctgttct gtgcacaagg gctatgcctt tgttcagtac tccaatgagc gccatgcccc 240
 ggcag 245

<210> 343

<210> 357
 <211> 188
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(188)
 <223> n = A,T,C or G

<400> 357
 tcgaccacgc cctcgtagcg catgngctnc aggacgatgc tcagagtgat gaacacccccg 60
 gtgcgggcca cgccagcact gcagtgcacc gtgataggcc catcctgtcc aaactgctcc 120
 ttgggtcttat gcacctgccc gatgaagtca atgaatccct cgctgtctt gggcacgccc 180
 tgctctgg 188

<210> 358
 <211> 291
 <212> DNA
 <213> Homo sapiens

<400> 358
 ctgggagcat cggcaagcta ctgccttaaa atccgatctc cccgagtgca caatttctgt 60
 cccttttaag ggttcacaac actaaagatt tcacatgaaa gggttgtgat tgatttgagc 120
 aggcaggcgg tacgtgacag gggctgcatg caccgggtgt cagagagaaa cagaacaggg 180
 caggggaattt cacaatgttc ttctatacaa tggctggaat ctatgaataa catcagtttc 240
 taagttatgg gttgattttt aactactggg tttaggccag gcaggcccag g 291

<210> 359
 <211> 117
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(117)
 <223> n = A,T,C or G

<400> 359
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 ccaaaaaaaaa ctcaaaaang taatgaatga tacccaangn gccttttcta gaaaaag 117

<210> 360
 <211> 394
 <212> DNA
 <213> Homo sapiens

<400> 360
 ctgttcctct ggggtgggtc agttctagag tgggagaaa ggagtcaggc gcattgggaa 60
 tcgtgggttc agtctgggtg cagaatctgc acatttgcca agaaattttc cctgtttgga 120
 aagtttgccc cagctttccc gggcacacca ccttttgtcc caagtgtctg ccggtcgacc 180


```

tgactttgag caggaggcag ttgcaggact tctcgttcac ggcttggcg atcctctttg 240
ggttggtcac tgtgagatca tccccacta cctggattcc tgcactggct gtgaacttct 300
gccaagctcc ccagtcaccc ttgtcaaagg gatcttcgat agacaccact gggtagtcct 360
tgatgaagga cttgtacagg tcagccag                                     388

```

```

<210> 374
<211> 393
<212> DNA
<213> Homo sapiens

```

```

<400> 374
ctgacgaccg cgtgaacccc tgcattgggg gtgtcaccct cttccatgag acactctacc 60
agaaggcgga tgatgggctt ccttcccccc aagttatcaa atccaaggcg ggtgttgtgg 120
gcatcaagggt agacaagggc gtgggtcccc tggcaggggc aaatggcgag actaccaccc 180
aagggttgga tgggctgtct gagcgctgtg ccagtagcaa gaaggacgga gctgacttcg 240
ccaagtggcg ttgtgtgctg aagattgggg aacacacccc ctcagccctc gccatcatgg 300
aaaatgccaa tgttctggcc cgttatgcca gtatctgcca gcagaatggc attgtgcca 360
tcgtggagcc tgagatcctc cctgatgggg acc                                     393

```

```

<210> 375
<211> 394
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(394)
<223> n = A,T,C or G

```

```

<400> 375
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aggaaagagg ggatgaactt gcagactctg cgcttgagat cttcaaaca gcatcagcgt 120
tttccagggc tttccagagg tctgtgagac tagccctgt ctatcaaaag ttattagaga 180
ggatgaagca ttagcttgaa gcactacagg agaatgcac cacggcagct ctccgccaat 240
ttctctcaga tttccacaga gactgtttga atgttttcaa aaccaagtat cacactttta 300
tgtacatggg ccgcaccata atgagatgtg agccttgtgc atgtggggga ggagggagag 360
agatgtactt tttaaatcat gttcccccta aaca                                     394

```

```

<210> 376
<211> 392
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(392)
<223> n = A,T,C or G

```

```

<400> 376
ctgcccagcc cccattggcg agtttgattn ggtgtgcagc aatgacaaca agaccttoga 60
ctcttctctg cacttctttt ccacaaagtg caccctggag ggcaccaaga agggccacaa 120

```

```

gctccacctg gactacatcg ggccttgcaa atacatcccc ccttgccctgg actctgagct 180
gaccgaattc cccctgcgca tgcgggactg gctcaagaac gtccctggta cccctgtatga 240
gagggatgag gacaacaacc ttctgactga gaagcagaag ctgcgggtga agaagatcca 300
tgagaatgag aagcgctcg aggaggaga ccacccctg gagctgctgg cccgggactt 360
cgagaagaac tataacatgt acatcttccc tg 392

```

```

<210> 377
<211> 292
<212> DNA
<213> Homo sapiens

```

```

<400> 377
caatgtttga tgcttaaccc cccaatttc tgtgagatgg atggccagtg caagcgtgac 60
ttgaagtgtt gcatgggcat gtgtgggaaa tcctgcgttt cccctgtgaa agcttgattc 120
ctgccatatg gaggaggctc tggagtcctg ctctgtgtgg tccaggctct ttccaccctg 180
agacttggtc ccaccactga tatcctcctt tggggaaagg cttggcacac agcaggcttt 240
caagaagtgc cagttgatca atgaataaat aaacgagcct atttctcttt gc 292

```

```

<210> 378
<211> 395
<212> DNA
<213> Homo sapiens

```

```

<400> 378
ctgctgcttc agogaagggt ttctggcata tccaatgata aggctgccaa agactgttcc 60
aataccagca ccagaaccag ccactcctac tgttgagca cctgcaccaa taaatttggtc 120
agcagtatca atgtctctgc tgattgcact ggtctgaaac tccctttgga ttagctgaga 180
cacaccattc tgggacctga ttttcctaag atagaactcc aactctttgc cctctagcac 240
atagccatct gctogggcac actgtcccg ccttgaagcg atgcacgcaa gaagcttgcc 300
ctgctggaac tgctcctcca ggagactgct gattttggca ttctttttcc ttcatcata 360
tttcttctga attttttaga tcgttttttg tttaa 395

```

```

<210> 379
<211> 223
<212> DNA
<213> Homo sapiens

```

```

<400> 379
ccagatgaaa tgctgocgca atggctgtgg gaaggtgtcc tgtgtcactc ccaattttctg 60
agctccagcc aaccaccaggc tgagcagtga ggagagaaag tttctgctg gccctgcac 120
tggttccagc ccacctgccc tccccctttt cgggactctg tattecctct tgggctgacc 180
acagcttctc cctttcccaa ccaataaagt aaccactttc agc 223

```

```

<210> 380
<211> 317
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(317)

```

<223> n = A,T,C or G

<400> 380

```
tcgaccacag tattccaacc ctctgtgcn tngagaagtg atggaggggtg ctgacaacca 60
gggtgcagga gaacaaggta gaccagttag gcagaatatg tatcggggat atagaccacg 120
attccgcagg ggccctctc gccaaagaca gcctagagag gacggcaatg aagaagataa 180
agaaaatcaa ggagatgaga cccaagggtc gcagccacct caacgtcggg accgccgcaa 240
cttcaattac cgacgcagac gccagaaaa ccctaaacca caagatggca aagagacaaa 300
agcagccgat ccaccag                                     317
```

<210> 381

<211> 392

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(392)

<223> n = A,T,C or G

<400> 381

```
cctgaaggaa gagctggcct acctgaatnn naaccatgag gaggaatca gtacgctgag 60
gggccaagtg ggaggccagg tcagtgtgga ggtggattcc gctccgggca ccgatctcgc 120
caagatcctg agtgacatgc gaagccaata tgaggatcat gccgagcaga accggaagga 180
tgctgaagcc tgggttcacca gccggactga agaattgaac cgggaggtcg ctggccacac 240
ggagcagctc cagatgagca ggtccgaggt tactgacctg cggcgacacc ttccaggtct 300
tgagattgag ctgcagtcac agacctcggc cgcgaccacg ctaagccgaa ttccagcaca 360
ctggcgggccg ttactagtgg atccgagctc gg                                     392
```

<210> 382

<211> 234

<212> DNA

<213> Homo sapiens

<400> 382

```
cctcgatgtc taaatgagcg tggtaaagga tgggtgctgc tggggtctcg tagatacctc 60
gggacttcat tccaatgaag cggttctcca cgatgtcaat acggcccacg ccatgcttgc 120
ccgcgacttc gttcaggtac atgaagagct ccaaggaggt ctgggtgggtg gtgccatcct 180
tgacgttggg caccttcaca gggacccctt ttttgaactc catctccaga atgt      234
```

<210> 383

<211> 396

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(396)

<223> n = A,T,C or G

<400> 383

```

ccttgacctt ttcagcaagt gggaagggtgt tttccgtctc cacagacaag gccaggactc 60
gtttgnaccc gttgatgata gaatggggta ctgatgcaac agttgggtag ccaatctgca 120
gacagacact ggcaacattg cggacaccca ggatttcaat ggtgcccctg gagattttag 180
tggtgatacc taaagcctgg aaaaaggagg tcttctcggg cccgagacca gtgttctggg 240
ctggcacagt gacttcacat ggggcaatgg caccagcacg ggcagcagac ctgccccggc 300
ggccgctoga aagccgaatt ccagcacact ggccggccgtt actagtggat ccgagctcgg 360
taccaagctt ggcgtaatca tggtcatagc tgtttc 396

```

<210> 384
 <211> 396
 <212> DNA
 <213> Homo sapiens

```

<400> 384
gctgaatagg cacagagggc acctgtacac cttcagacca gtctgcaacc tcaggctgag 60
tagcagtga ctcaggagcg ggagcagtc attcaccctg aaattcctcc ttggtcactg 120
ccttctcagc agcagcctgc tcttcttttt caatctcttc aggatctctg tagaagtaca 180
gatcaggcat gacctcccat ggggtgttcac gggaaatggg gccacgcatg cgcagaactt 240
cccagaccag catccaccac atcaaaccac ctgagtgagc tcccttggtg ttgcatggga 300
tggcaatgtc cacatagcgc agaggagaat ctgtgttaca cagcgcaatg gtaggtagg 360
taacataaga tgcctccgtg agaggctggg ggtcag 396

```

<210> 385
 <211> 2943
 <212> DNA
 <213> Homo sapiens

```

<400> 385
cagccaccgg agtggatgcc atctgcaccc accgccctga cccacagggc cctgggctgg 60
acagagagca gctgtatttg gagctgagcc agctgaccca cagcatcact gagctggggc 120
cctacaccct ggacagggac agtctctatg tcaatggttt cacacagcgg agctctgtgc 180
ccaccactag cattcctggg acccccacag tggacctggg aacatctggg actccagttt 240
ctaaacctgg tccctcggct gccagccctc tcctgggtgt attcactctc aacttcacca 300
tcaccaacct gcggtatgag gagaacatgc agcaccctgg ctccaggaag ttcaacacca 360
cggagagggg ccttcagggc ctggtocctg ttcaagagca ccagtgttg cctctgttac 420
tctggctgca gactgacttt gctcaggcct gaaaaggatg ggacagccac tggagtggat 480
gccatctgca cccaccaccc tgacccccaa agccctaggc tggacagaga gcagctgtat 540
tgggagctga gccagctgac ccacaatatc actgagctgg gccctatgc cctggacaac 600
gacagcctct ttgtcaatgg ttctactcat cggagctctg tgtccaccac cagcactcct 660
gggaccccca cagtgtatct gggagcatct aagactccag cctcgatatt tggcccttca 720
gctgccagcc atctcctgat actattcacc ctcaacttca ccatcactaa cctgcggtat 780
gaggagaaca tgtggcctgg ctccaggaag ttcaacacta cagagagggg ccttcagggc 840
ctgctaaggc ccttgttcaa gaacaccagt gttggccctc tgtactctgg ctgcaggctg 900
accttgctca ggccagagaa agatggggaa gccaccggag tggatgccat ctgcaccac 960
cgccctgacc ccacagggcc tgggctggac agagagcagc tgtatttggg gctgagccag 1020
ctgaccaca gcatcactga gctgggcccc tacacactgg acagggacag tctctatgtc 1080
aatggtttca cccatcgagg ctctgtaccc accaccagca ccgggggtgg cagcgaggag 1140
ccattcacac tgaacttcac catcaacaac ctgcgtaca tggcgacat gggccaaccc 1200
ggctccctca agttcaacat cacagacaac gtcataagc acctgctcag tcctttgttc 1260
cagaggagca gcctgggtgc acggtacaca ggctgcaggg tcatcgact aaggtctgtg 1320
aagaacggtg ctgagacacg ggtggacctc ctctgcacct acctgcagcc cctcagcggc 1380

```

```

ccaggctctgc ctatcaagca ggtgttccat gagctgagcc agcagaccca tggcatcacc 1440
cggctcgggccc cctactctct ggacaaagac agcctctacc ttaacggtta caatgaacct 1500
ggtccagatg agcctcctac aactcccaag ccagccacca cattcctgcc tcctctgtca 1560
gaagccacaa cagccatggg gtaccacctg aagacctca cactcaactt caccatctcc 1620
aatctccagt attcaccaga tatgggcaag ggctcagcta cattcaactc caccgagggg 1680
gtccttcagc acctgctcag acccttggtc cagaagagca gcatggggccc cttctacttg 1740
ggttgccaac tgatctccct caggcctgag aaggatgggg cagccactgg tgtggacacc 1800
acctgcacct accacctga ccctgtgggc cccgggctgg acatacagca gctttactgg 1860
gagctgagtc agctgaccca tgggtgtcacc caactgggct tctatgtcct ggacagggat 1920
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aatctccaca ttgtcaactg gaacctcagt aatccagacc ccacatcctc agagtacatc 2040
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acagaaatgg agtcatcagt ttatcaacca acaagcagct ccagcacca gcacttctac 2340
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gtgtaacttc tcgccactgg ctcgagagat agacagagtt gccatctatg aggaatttct 2520
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tgtggatggg tattttccca acagaaatga gcccttaact gggaattctg accttccctt 2640
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cgggtgctctg gtgaccaccc gccggcgga gaaggaagga gaatacaacg tccagcaaca 2760
gtgccaggc tactaccagt cacacctaga cctggaggat ctgcaatgac tggaaacttg 2820
cgggtgctgg ggtgcctttc cccagccag ggtccaaaga agcttggctg gggcagaaat 2880
aaaccatatt ggtcggaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 2940
aaa

```

<210> 386

<211> 2608

<212> DNA

<213> Homo sapiens

<400> 386

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gttcaagagc accagtgttg gccctctgta ctctggetgc agactgactt tgctcaggcc 60
tgaaaaggat gggacagcca ctggagtggg tgccatctgc accaccacc ctgaccccaa 120
aagccctagg ctggacagag agcagctgta ttgggagctg agccagctga cccacaatat 180
cactgagctg ggccctatg ccctggacaa cgacagcctc tttgtcaatg gtttctactca 240
tcggagctct gtgtccacca ccagcactcc tgggaccccc acagtgtatc tgggagcatc 300
taagactcca gctcgatat ttggcccttc agctgccagc catctcctga tactattcac 360
cctcaacttc accatcacta acctgcggta tgaggagaac atgtggcctg gctccaggaa 420
gttcaacact acagagaggg tccttcaggg cctgctaagg ccttggttca agaaccaccag 480
tgttggccct ctgtactctg gctgcaggct gaccttgctc aggcacagaga aagatggggg 540
agccaccgga gtggatgcca tctgcaccca ccgccctgac cccacaggcc ctgggctgga 600
cagagagcag ctgtatttgg agctgagcca gctgacccac agcatcactg agctggggccc 660
ctacacactg gacagggaca gtctctatgt caatggtttc acccatcgga gctctgtacc 720
caccaccagc accggggtgg tcagcgagga gccattcaca ctgaacttca ccatcaacaa 780
cctgcgctac atggcgga ca tgggccaacc cggtccctc aagttcaaca tcacagacaa 840
cgtcatgaag cacctgctca gtcccttgtt ccagaggagc agcctgggtg cacgggtacac 900
aggctgcagg gtcctgcac taaggctctg gaagaacggg gctgagacac ggggtggacct 960
cctctgcacc tacctgcagc ccctcagcgg cccaggctctg cctatcaagc aggtgttcca 1020

```


	165		170		175
Tyr Leu Gly Ala Ser Lys Thr Pro Ala Ser Ile Phe Gly Pro Ser Ala					
	180		185		190
Ala Ser His Leu Leu Ile Leu Phe Thr Leu Asn Phe Thr Ile Thr Asn					
	195		200		205
Leu Arg Tyr Glu Glu Asn Met Trp Pro Gly Ser Arg Lys Phe Asn Thr					
	210		215		220
Thr Glu Arg Val Leu Gln Gly Leu Leu Arg Pro Leu Phe Lys Asn Thr					
	225		230		235
Ser Val Gly Pro Leu Tyr Ser Gly Cys Arg Leu Thr Leu Leu Arg Pro					
	245		250		255
Glu Lys Asp Gly Glu Ala Thr Gly Val Asp Ala Ile Cys Thr His Arg					
	260		265		270
Pro Asp Pro Thr Gly Pro Gly Leu Asp Arg Glu Gln Leu Tyr Leu Glu					
	275		280		285
Leu Ser Gln Leu Thr His Ser Ile Thr Glu Leu Gly Pro Tyr Thr Leu					
	290		295		300
Asp Arg Asp Ser Leu Tyr Val Asn Gly Phe Thr His Arg Ser Ser Val					
	305		310		315
Pro Thr Thr Ser Thr Gly Val Val Ser Glu Glu Pro Phe Thr Leu Asn					
	325		330		335
Phe Thr Ile Asn Asn Leu Arg Tyr Met Ala Asp Met Gly Gln Pro Gly					
	340		345		350
Ser Leu Lys Phe Asn Ile Thr Asp Asn Val Met Lys His Leu Leu Ser					
	355		360		365
Pro Leu Phe Gln Arg Ser Ser Leu Gly Ala Arg Tyr Thr Gly Cys Arg					
	370		375		380
Val Ile Ala Leu Arg Ser Val Lys Asn Gly Ala Glu Thr Arg Val Asp					
	385		390		395
Leu Leu Cys Thr Tyr Leu Gln Pro Leu Ser Gly Pro Gly Leu Pro Ile					
	405		410		415
Lys Gln Val Phe His Glu Leu Ser Gln Gln Thr His Gly Ile Thr Arg					
	420		425		430
Leu Gly Pro Tyr Ser Leu Asp Lys Asp Ser Leu Tyr Leu Asn Gly Tyr					

000180-1089960


```
<210> 389
<211> 833
<212> PRT
<213> Homo sapiens
```

```

<400> 389
Phe Lys Ser Thr Ser Val Gly Pro Leu Tyr Ser Gly Cys Arg Leu Thr
      5                      10                      15

Leu Leu Arg Pro Glu Lys Asp Gly Thr Ala Thr Gly Val Asp Ala Ile
      20                      25                      30

Cys Thr His His Pro Asp Pro Lys Ser Pro Arg Leu Asp Arg Glu Gln
      35                      40                      45

Leu Tyr Trp Glu Leu Ser Gln Leu Thr His Asn Ile Thr Glu Leu Gly
      50                      55                      60

Pro Tyr Ala Leu Asp Asn Asp Ser Leu Phe Val Asn Gly Phe Thr His
      65                      70                      75                      80

Arg Ser Ser Val Ser Thr Thr Ser Thr Pro Gly Thr Pro Thr Val Tyr
      85                      90                      95

Leu Gly Ala Ser Lys Thr Pro Ala Ser Ile Phe Gly Pro Ser Ala Ala
      100                      105                      110

Ser His Leu Leu Ile Leu Phe Thr Leu Asn Phe Thr Ile Thr Asn Leu
      115                      120                      125

Arg Tyr Glu Glu Asn Met Trp Pro Gly Ser Arg Lys Phe Asn Thr Thr
      130                      135                      140

Glu Arg Val Leu Gln Gly Leu Leu Arg Pro Leu Phe Lys Asn Thr Ser
      145                      150                      155                      160

```


Gln His Leu Leu Arg Pro Leu Phe Gln Lys Ser Ser Met Gly Pro Phe
 435 440 445
 Tyr Leu Gly Cys Gln Leu Ile Ser Leu Arg Pro Glu Lys Asp Gly Ala
 450 455 460
 Ala Thr Gly Val Asp Thr Thr Cys Thr Tyr His Pro Asp Pro Val Gly
 465 470 475 480
 Pro Gly Leu Asp Ile Gln Gln Leu Tyr Trp Glu Leu Ser Gln Leu Thr
 485 490 495
 His Gly Val Thr Gln Leu Gly Phe Tyr Val Leu Asp Arg Asp Ser Leu
 500 505 510
 Phe Ile Asn Gly Tyr Ala Pro Gln Asn Leu Ser Ile Arg Gly Glu Tyr
 515 520 525
 Gln Ile Asn Phe His Ile Val Asn Trp Asn Leu Ser Asn Pro Asp Pro
 530 535 540
 Thr Ser Ser Glu Tyr Ile Thr Leu Leu Arg Asp Ile Gln Asp Lys Val
 545 550 555 560
 Thr Thr Leu Tyr Lys Gly Ser Gln Leu His Asp Thr Phe Arg Phe Cys
 565 570 575
 Leu Val Thr Asn Leu Thr Met Asp Ser Val Leu Val Thr Val Lys Ala
 580 585 590
 Leu Phe Ser Ser Asn Leu Asp Pro Ser Leu Val Glu Gln Val Phe Leu
 595 600 605
 Asp Lys Thr Leu Asn Ala Ser Phe His Trp Leu Gly Ser Thr Tyr Gln
 610 615 620
 Leu Val Asp Ile His Val Thr Glu Met Glu Ser Ser Val Tyr Gln Pro
 625 630 635 640
 Thr Ser Ser Ser Ser Thr Gln His Phe Tyr Leu Asn Phe Thr Ile Thr
 645 650 655
 Asn Leu Pro Tyr Ser Gln Asp Lys Ala Gln Pro Gly Thr Thr Asn Tyr
 660 665 670
 Gln Arg Asn Lys Arg Asn Ile Glu Asp Ala Leu Asn Gln Leu Phe Arg
 675 680 685
 Asn Ser Ser Ile Lys Ser Tyr Phe Ser Asp Cys Gln Val Ser Thr Phe
 690 695 700

000T80" T083E 450

Thr Ser Lys Gly Lys Gly Asn Ala Asn Leu Glu Tyr Lys Thr Gly Ala
165 170 175

Phe Ser Met Pro Glu Val Asn Val Asp Tyr Asn Ala Ser Ser Glu Thr
180 185 190

Leu Arg Cys Glu Ala Pro Arg Trp Phe Pro Gln Pro Thr Val Val Trp
195 200 205

Ala Ser Gln Val Asp Gln Gly Ala Asn Phe Ser Glu Val Ser Asn Thr
210 215 220

Ser Phe Glu Leu Asn Ser Glu Asn Val Thr Met Lys Val Val Ser Val
225 230 235 240

Leu Tyr Asn Val Thr Ile Asn Asn Thr Tyr Ser Cys Met Ile Glu Asn
245 250 255

Asp Ile Ala Lys Ala Thr Gly Asp Ile Lys Val Thr Glu Ser Glu Ile
260 265 270

Lys Arg Arg Ser His Leu Gln Leu Leu Asn Ser Lys Ala Ser Leu Cys
275 280 285

Val Ser Ser Phe Phe Ala Ile Ser Trp Ala Leu Leu Pro Leu Ser Pro
290 295 300

Tyr Leu Met Leu Lys
305

<210> 393

<211> 282

<212> PRT

<213> Homo sapiens

<400> 393

Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile Ser Ile Ile
5 10 15

Ile Ile Leu Ala Gly Ala Ile Ala Leu Ile Ile Gly Phe Gly Ile Ser
20 25 30

Gly Arg His Ser Ile Thr Val Thr Thr Val Ala Ser Ala Gly Asn Ile
35 40 45

Gly Glu Asp Gly Ile Leu Ser Cys Thr Phe Glu Pro Asp Ile Lys Leu
50 55 60

Ser Asp Ile Val Ile Gln Trp Leu Lys Glu Gly Val Leu Gly Leu Val

000730 "T0995950

```
<400> 394
Met Ala Ser Leu Gly Gln Ile Leu Phe Trp Ser Ile Ile Ser Ile Ile
 1          5          10          15
Ile Ile Leu Ala
      20
```

<210> 395
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 395
 Ile Ile Ile Leu Ala Gly Ala Ile Ala Leu Ile Ile Gly Phe Gly Ile
 1 5 10 15
 Ser Gly Arg His
 20

<210> 396
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 396
 Ile Ser Gly Arg His Ser Ile Thr Val Thr Thr Val Ala Ser Ala Gly
 1 5 10 15
 Asn Ile Gly Glu
 20

<210> 397
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 397
 Gly Asn Ile Gly Glu Asp Gly Ile Leu Ser Cys Thr Phe Glu Pro Asp
 1 5 10 15
 Ile Lys Leu Ser
 20

<210> 398
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 398
 Asp Ile Lys Leu Ser Asp Ile Val Ile Gln Trp Leu Lys Glu Gly Val
 1 5 10 15
 Leu Gly Leu Val
 20

<210> 399
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 399

Val Leu Gly Leu Val His Glu Phe Lys Glu Gly Lys Asp Glu Leu Ser
 1 5 10 15
 Glu Gln Asp Glu
 20

<210> 400
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 400
 Ser Glu Gln Asp Glu Met Phe Arg Gly Arg Thr Ala Val Phe Ala Asp
 1 5 10 15
 Gln Val Ile Val
 20

<210> 401
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 401
 Asp Gln Val Ile Val Gly Asn Ala Ser Leu Arg Leu Lys Asn Val Gln
 1 5 10 15
 Leu Thr Asp Ala
 20

<210> 402
 <211> 21
 <212> PRT
 <213> Homo sapiens

<400> 402
 Val Gln Leu Thr Asp Ala Gly Thr Tyr Lys Cys Tyr Ile Ile Thr Ser
 1 5 10 15
 Lys Gly Lys Gly Asn
 20

<210> 403
 <211> 20
 <212> PRT
 <213> Homo sapiens

<400> 403
 Lys Gly Lys Gly Asn Ala Asn Leu Glu Tyr Lys Thr Gly Ala Phe Ser
 1 5 10 15
 Met Pro Glu Val
 20

<210> 404
 <211> 20

20

<210> 409

<211> 20

<212> PRT

<213> Homo sapiens

<400> 409

Met Ile Glu Asn Asp Ile Ala Lys Ala Thr Gly Asp Ile Lys Val Thr

1

5

10

15

Glu Ser Glu Ile

20

<210> 410

<211> 20

<212> PRT

<213> Homo sapiens

<400> 410

Thr Glu Ser Glu Ile Lys Arg Arg Ser His Leu Gln Leu Leu Asn Ser

1

5

10

15

Lys Ala Ser Leu

20

<210> 411

<211> 20

<212> PRT

<213> Homo sapiens

<400> 411

Ser Lys Ala Ser Leu Cys Val Ser Ser Phe Phe Ala Ile Ser Trp Ala

1

5

10

15

Leu Leu Pro Leu

20

<210> 412

<211> 20

<212> PRT

<213> Homo sapiens

<400> 412

Ser Ser Phe Phe Ala Ile Ser Trp Ala Leu Leu Pro Leu Ser Pro Tyr

1

5

10

15

Leu Met Leu Lys

20

<210> 413

<211> 35

<212> PRT

<213> Homo sapiens

000T810-1085E050

<400> 451

Ser Leu Gly Gln Ile Leu Phe Trp Ser

1 5

<210> 452

<211> 9

<212> PRT

<213> Homo sapiens

<400> 452

Ile Ala Leu Ile Ile Gly Phe Gly Ile

1 5

<210> 453

<211> 9

<212> PRT

<213> Homo sapiens

<400> 453

Cys Thr Phe Glu Pro Asp Ile Lys Leu

1 5

<210> 454

<211> 9

<212> PRT

<213> Homo sapiens

<400> 454

Ile Val Gly Asn Ala Ser Leu Arg Leu

1 5

<210> 455

<211> 9

<212> PRT

<213> Homo sapiens

<400> 455

Gly Gln Ile Leu Phe Trp Ser Ile Ile

1 5

000T80" T080E950